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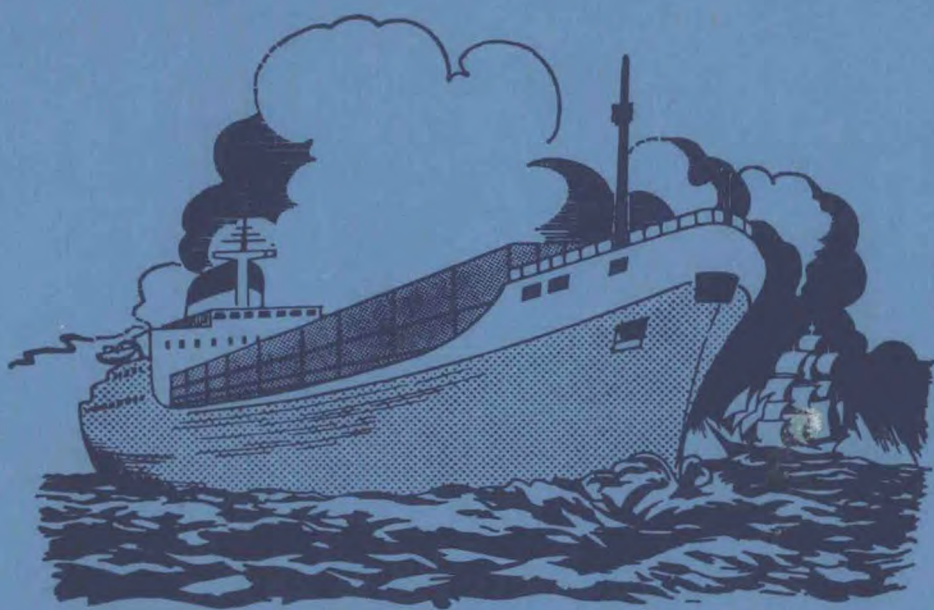
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The Marine Observer

*A quarterly journal of Maritime
Meteorology*



Volume 56 No. 291

January 1986

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THE MARINE OBSERVER

A Quarterly Journal of Maritime Meteorology
prepared by the Marine Division of the
Meteorological Office

Vol. 56

1986



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THE MARINE OBSERVER

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VOL. 56

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JANUARY 1986

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*Letters to the Editor, and books for review, should be sent to the Editor 'The Marine Observer',
Meteorological Office, Eastern Road, Bracknell, Berkshire RG12 2UR*

LONDON: HER MAJESTY'S STATIONERY OFFICE

Editorial

Timely arrival at their destination is a frequent preoccupation of mariners the world over; gazing skywards is another. These customs are possibly the reason for the intense interest in what it is hoped will be the most extraordinary arrival of a craft at its destination on 13 March this year.

After its unique journey from earth, the *Giotto* spacecraft is expected to send back close-up colour photographs of Halley's Comet the very next day, and for millions of viewers to have the first ever close view of this phenomenon almost as it happens is truly astounding.

In his excellent article on the history and prognosis for the comet's visit, specially written for this issue, Mr Ron Livesey of the British Astronomical Association gives us cause to speculate that the apparition may not be up to expectation. By the time these words are in print many weeks after being written we may have the answers to the questions about how clearly we may see Comet Halley: it seems certain that those in the Southern Hemisphere will be luckier than those to the north, as its closest approach to the earth in early April 1986 will be at a declination between 40° and 50° south.

For shipboard observers who are fortunate enough to see the comet clearly, we shall welcome reports, sketches and photographs of what they have seen and will publish suitable items as early as possible, rather than wait until the appropriate quarterly edition the following year which is our standard practice with ships' reports. We will nevertheless need the three months lead time before we can publish, as usual. Whilst astronomical journals contain advertisements inviting us to make unique trips to South Africa, Australia or South America to gain ringside seats for comet gazing, the voyage of the *Giotto* satellite and its Russian and Japanese counterparts are creating great excitement around the globe.*

The European Space Agency satellite is named after the Florentine artist Giotto di Bondone who used Halley's comet as a model in his famous painting *The Adoration of the Magi* after seeing the apparition of 1301. The satellite was launched from Kourou, French Guiana, on 2 July 1985 and on its 8-month orbit, more than three-quarters of the way around the sun, it will journey about 700 million kilometres to rendezvous with the comet. The probe was created with help from the Universities of Kent and London who co-operated with the 10-nation team led by British Aerospace, and will carry out scientific experiments to discover the comet's physical and chemical analysis in more detail than has ever been possible before by spectral methods.

The folk who saw and wondered at the apparition of the year 1145, when the comet was visible to the unaided eye for 67 days, would doubtless be amazed to think it could be approached so closely by an earth vehicle. It must have been a truly spectacular sight at its closest known pass in 837 A.D. when the minimum distance from the Earth is estimated to have been between 5 and 6 million kilometres, the brilliancy was as great as that of Venus and the tail extended through an arc of 93° across the sky. We must be content with a CPA of 60 million kilometres by contrast, on 11 April this year.

* The Royal Institute of Navigation are holding a special meeting on 19 March to analyse the results in a talk entitled 'The Giotto Mission - The Interception of Halley's Comet' to be given by J. A. Jensen, E.S.A., and Dr J. F. Jordon, Jet Propulsion Laboratory, California. The meeting will be held at the Royal Institution of Naval Architects, Upper Belgrave Street, London, commencing at 1430. Non-members are particularly welcome.

Returning to talk of earthly craft, readers may have read in the national media that the Marine Division is to have a change of Ocean Weather Ships (OWS). It has not been possible to publish details in this journal before now, whilst protracted discussions were under way.

With the end of *Starella's* charter fast approaching in January 1986, the North Atlantic Ocean Stations (NAOS) Board agreed upon changes in the manning of the ocean weather stations. The Met. Office would purchase the Netherlands ows *Cumulus* for a nominal sum on the expiry of the *Starella* charter, and single-man Ocean Station 'Lima' with short returns to her new home base at Greenock for replenishment, once in every 33 days. The management, manning, operation and maintenance of *Cumulus* will continue to be handled by J. Marr & Son of Hull, who have so ably operated the *Starella* for the last four years. Met. Office staff will continue to handle the meteorological and oceanographic work.

Cumulus was due to be handed over to the Met. Office at Hull in mid-December; on 31 December 1985 both the Netherlands and France withdrew from NAOS, preferring to harness their financial resources on to new technologies such as upper air soundings from merchant ships and aircraft weather data relay. The U.S.S.R. and Norway continue to man Ocean Stations 'Charlie' and 'Mike' respectively. These new arrangements are expected to last until the end of 1988, from which time WMO is considering the introduction of a composite observing system for the North Atlantic, consisting of automatic transmission of weather data from fixed and floating buoys, upper-air units on mobile merchant ships, aircraft data relay and satellite readings. All this in addition to the continuing vital observations from voluntary observing ships, whose importance will be even more significant when the demise of Ocean Weather Ships comes to pass due to unacceptably high costs.

No change is envisaged in the Voluntary Observing Fleet code in the immediate future and observers can therefore rest assured that they may continue the noticeable improvement in records that comes with experience with the present code, introduced in January 1982. Several Masters and Officers have commented upon their satisfaction of knowing that meteorological logbook remarks in profusion really can be of considerable use in building climatic records. We continue to be impressed by the quality of additional reports of marine phenomena and the excellence of colour photographs and drawings; in particular, Dr Frank Evans of the Dove Marine Laboratory, Cullercoats, has been surprised by accounts of the massing of *Velella velella*, 'By-the-wind-sailor', in the North Pacific in spring 1985, and would be pleased to hear of any more such sightings if not already reported in ships' logs.

Receipt of these colour photographs in increasing numbers and of fine quality, so augmenting reports from ships' staff, has had another beneficial result. With this edition of *The Marine Observer*, we are delighted to advise readers and contributors that arrangements have been made with H.M.S.O. to include colour photographs for the first time. We expect to continue this practice by virtue of the active co-operation of marine observers and their colleagues afloat, who are invited to provide prints, negatives or slides, preferably in colour, together with the reports they serve to augment.

In concluding with perenial good wishes to all our readers for a successful year, it is a sincere hope that they will have the opportunity of obtaining a good impression of that remarkable comet that comes into view for most of us but once in a lifetime.

J.F.T.H



January, February, March

126

The Marine Observers' Log is a quarterly selection of observations of interest and value. The observations are derived from the logbooks of marine observers and from individual manuscripts. Responsibility for each observation rests with the contributor.

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128
129

130 Observing officers are reminded that preserved samples of discoloured water,
131 luminescent water, etc. considerably enhance the value of such an observation.
132 Port Meteorological Officers in the UK will supply instructions on how to
133 preserve and pack such samples on request.

TROPICAL CYCLONE 'GAVIN'

Western South Pacific

m.v. *Wellington Star*. Captain P. H. Daniel. Auckland to Honolulu. Observers: the Master, Mr P. J. Newton, Chief Officer, Mr D. J. Dawson, 2nd Officer, Mr L. St J. Campbell, 3rd Officer and ship's company.

4-7 March 1985. The vessel left Auckland at 1000 GMT on 4 March, bound for Honolulu. Conditions on departure were fine with a fresh north-easterly breeze and partly clouded skies.

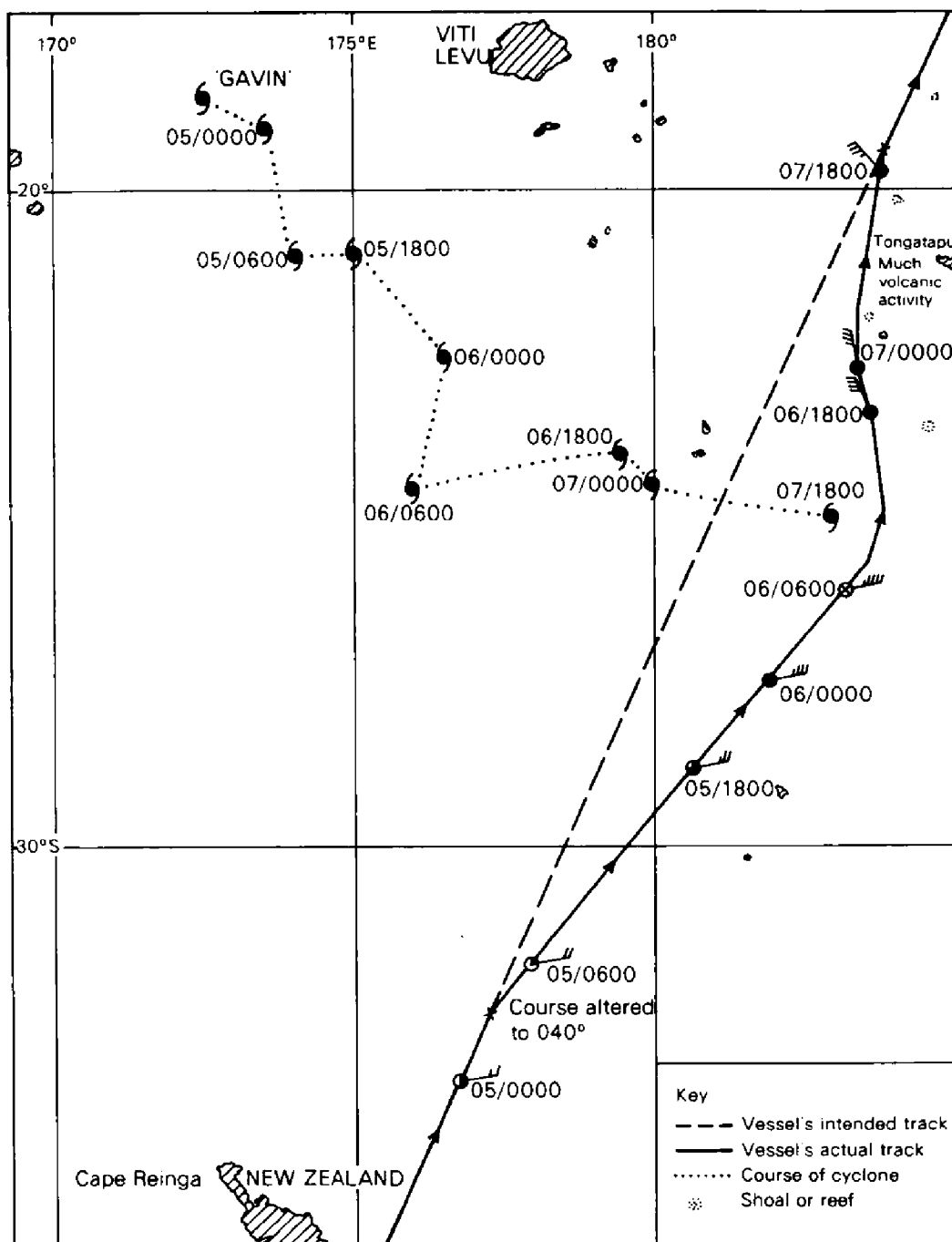
At 1800, tropical cyclone 'Gavin' was reported by Wellington Radio to be centred near 18.5°S, 172.5°E, moving towards the south-east at 12 knots. Winds were said to be in excess of 50 knots near the centre and 33 knots within 300 n. mile. The position was given as 'fair' and forecast positions indicated that as long as there was no appreciable increase in its speed, the cyclone would pass well beyond 300 n. mile to the south of us.

We continued to receive frequent weather reports from Wellington Radio and a continuous appraisal was made for the situation using both known and forecast positions of the storm.

By 0000 on 5 March, the wind was freshening considerably and had veered slightly to the east. Reports on Gavin were now labelled 'poor' and so at 0300 in order to give ourselves a somewhat larger clearing distance, we altered course to 040° from 024°, as noted on the diagram opposite.

Any sudden curvature that the cyclone may have made was expected to be towards the south or south-west, this eliminated our option of a possible alteration to the west and the vessel continued to make all available speed on her new heading.

By 0000 on 6 March, the wind had increased to force 8 and we were experiencing very rough seas combined with a heavy E'ly swell and occasional rain showers. At 0600, the seas were mountainous with continuous heavy driving rain, which along with an excessive amount of spray, reduced visibility considerably in the now force 9 winds (gusting to force 10).



The wind started to back gradually towards the north at 0800, indicating that we possibly had the cyclone on our beam. Throughout the previous day, the barometric pressure had been falling rapidly and it continued to do so.

Our course of 040° was taking us in towards the islands of the Tongatapu group. This vaguely-charted, somewhat uncertain area was better avoided and so a succession of small alterations was made over the next twenty-four hours to keep us clear of the numerous shoals and reefs, as well as maintaining a respectable distance away from the cyclone.

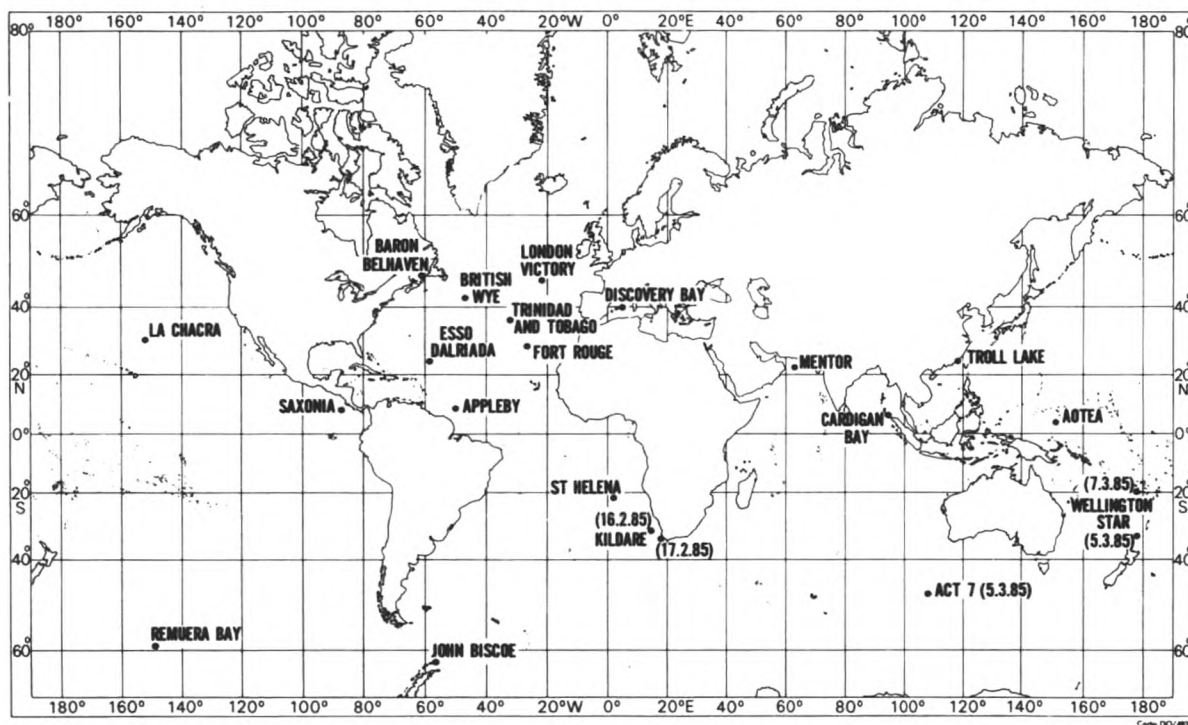
At 0000 on 7 March, with the cyclone probably just abaft the beam, we were experiencing winds of force 10, gusting to force 11, and an extremely heavy swell from the north-west. The vessel's speed had to be reduced to ease the now violent motion.

This was in all likelihood our closest approach to Gavin, at a distance of approximately 210 n. mile, bearing 240°. The pressure then steadied and remained in the region of 989 mb for about nine hours. At 1800 the pressure was steadily rising and the rain had cleared considerably, only coming in brief showers, the wind started to ease and the swell was moderating.

We resumed our course for Honolulu at 2000, although heavy seas still restricted us to slow steaming.

Position of ship at 0000 GMT on 5 March: 33° 18's, 176° 42'E.

Position of ship at 1800 GMT on 7 March: 19° 42's, 176° 12'E.



Position of ships whose reports appear in *The Marine Observers' Log*

DEPRESSION

Gulf of St Lawrence

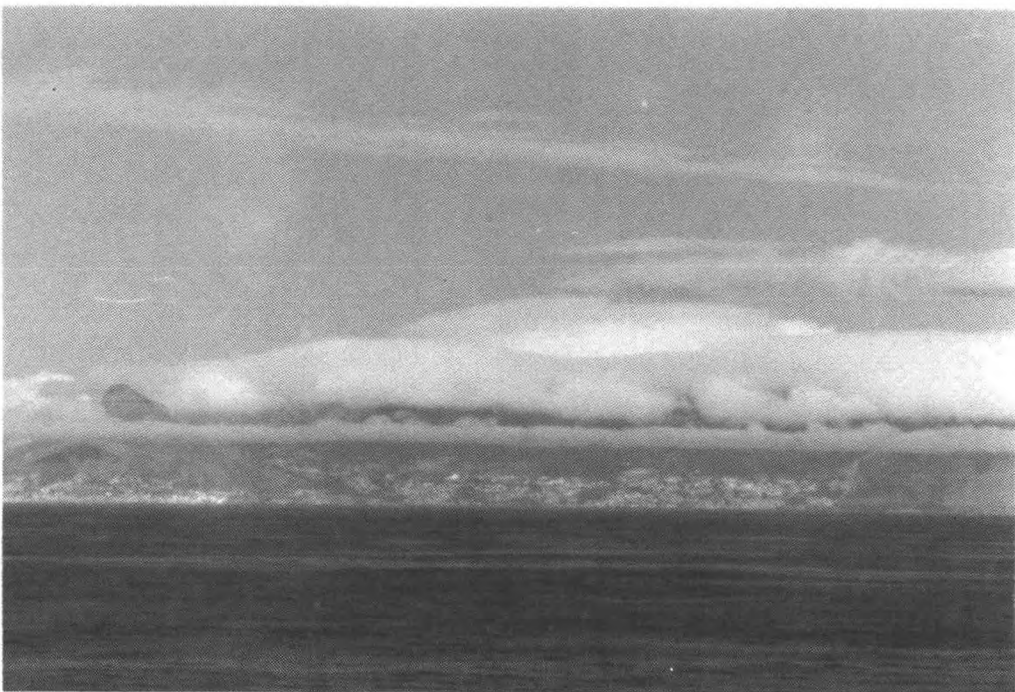
m.v. *Baron Belhaven*. Captain L. M. Hocking. Port Esquivel (Jamaica) to Port Alfred. Observers: the Master, Mr P. B. W. Newton, 3rd Officer and ship's company.

20–22 January 1985. On 20 January, the ship was off Nova Scotia and approaching the Gulf of St Lawrence, arriving there at 0100 GMT on 21 January. During this time, weather conditions started to deteriorate and continued to worsen. The following observations were made as the vessel proceeded towards Port Alfred and the barogram illustrates the contours of the depression.



Photo by B. A. Mullan

Butterfly photographed on board m.v. *Cardigan Bay*. (See page 18)



Orographic cloud observed forming over the Table Mountain area from
m.v. *Kildare* (See page 20)

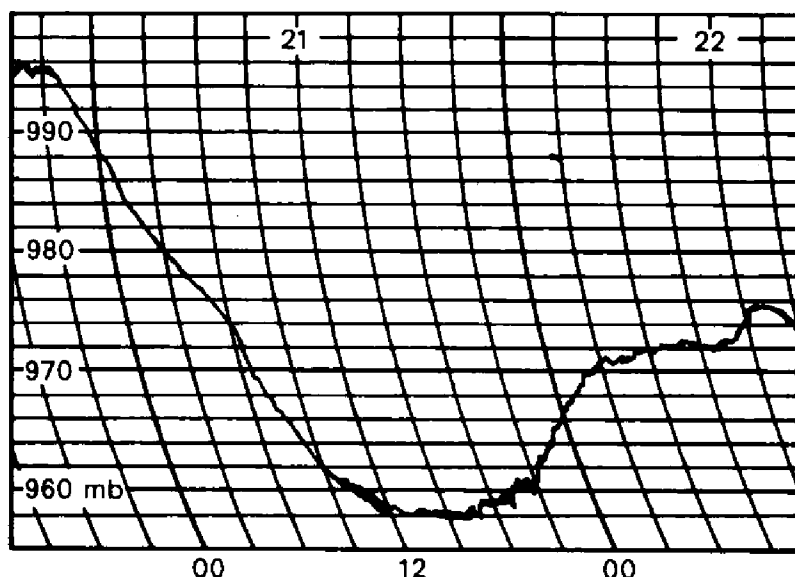


Photos by Captain J. F. Thomson

The exceptional wave which damaged m.v. *British Wye*. (See page 9)



Date and time (GMT)	Wind Dir'n	Force	Dry bulb (°c)	Pressure and Remarks
20th 2100	Variable		- 1.0	996 mb., beginning to fall. Vessel passing up coast towards St Paul Island.
21st 0100	S'E	4	- 1.5	994 mb. Vessel passes St Paul Island.
0500	SE	3	- 2.0	986 mb. Overcast with snow flurries. Vessel passes Bird Island at 0600, navigating through close pack ice.



0900	E	5	- 2.0	969 mb. Weather and ice as for previous observation.
1140	N	6	—	Navigating through close pack ice.
1300	N	8	- 5.0	961 mb. Overcast with continuous snow.
1700	WNW	10	- 8.0	960 mb. Overcast, blizzards. Navigating through open pack ice.
2100	WSW	10	- 9.0	964 mb. Overcast with snow squalls. Navigating through open water.
22nd 0100	WSW	9	- 9.0	968 mb. Overcast, clear. Navigating through open pack ice.
0500	WSW	9	-11.0	972 mb. Weather and ice situation as for previous observation.
0900	W	9	-12.0	975 mb. Clouds begin to break up.
1200	—	—	—	Vessel arrives at Escoumains Pilot Station.
1300	W	6	-12.0	976 mb. Few clouds, fine and clear.

At 1500, the vessel was beset in pack ice on the Saguenay River, the wind was w'ly, force 4, dry bulb -7.0 and pressure 974 mb, beginning to rise gradually. Approximate position of ship at 0600 GMT on 21 January: 47° 54' N, 61° 00' W.

HEAVY WEATHER

Western North Atlantic

m.v. *British Wye*. Captain J. F. Thomson. Milford Haven to Boston (Mass.)
 Observers: the Master, Mr T. L. Cullen, 2nd Officer, Mr S. P. Weston, 3rd Officer, Mr C. Winterbottom, 3rd Officer and ship's company.

4-5 February 1985. Whilst on passage, the ship encountered hurricane force

winds and very heavy seas associated with a vigorous depression which was moving in a generally E'ly direction. Warning of the storm had been received at about 0100 GMT on 4 February.

At 1030 GMT, the wind was W'N, force 12 causing spray which seriously affected the visibility, barometric pressure was 983.5 mb and the air temperature was 0.0°C.

Observations of wave and weather conditions were taken hourly, and a selection of the reports follows

Date and time (GMT)		Wind		Wave Height Estimated (ft)	Temperature (°C)		Pressure and remarks
		Dir'n	Force		Dry	Wet	
4th	1130	290	12	30-40	-0.2	-0.4	984.7 mb. Ship's speed 3.5 knots.
	1430	290	12+	30-50	0.0	-0.5	988.0 mb. Wintry precipitation.
	1600	290	12+	60	—	—	Several ladders badly distorted. Hydraulic and steam pipe guards carried away. Steam and air lines damaged. Position: 42° 04'N, 48° 25'W.
	1630	300	12+	50	-0.5	-1.0	988.7 mb. Wintry precipitation. Vessel hove to.
	1730	290	12	30-50	0.0	-1.0	991.6 mb.
	2030	310	12	30-50	0.0	-1.0	995.3 mb. Cloud cover beginning to break.
	2330	315	11/12	30-45	-0.2	-0.8	999.9 mb. Cloud cover more broken.
	0230	315	11/12	30-45	-0.3	-0.5	Cloud cover broken in places.
	0530	310	11+	40+	-2.0	-2.5	1005.5 mb. Cloud cover complete.
	0830	325	10	20-30	-2.2	-2.7	1006.9 mb. Cloud cover broken in places.
5th	1130	320	9	20-30	-1.6	-1.7	1009.1 mb. Snow showers. Ice accretion approx 2 cm thick forward on stays.
	1630	315	9+	20-30	-0.5	-0.5	1009.3 mb falling. Wintry showers, heavy spray.
	1930	300	10	20-30	0.0	-0.5	1009.0 mb. Wintry showers, heavy spray.

The wave which occurred at 1600 on 4 February had a horizontal distance between crest and trough of 300 m. Several photographs were taken of it approaching the ship, and two of these are reproduced opposite page 9.

Position of ship at 0000 GMT on 4 February 1985: 42° 36'N, 46° 42'W.

Position of ship at 1800 GMT on 5 February 1985: 42° 06'N, 52° 54'W.

Eastern North Atlantic

m.v. *London Victory*. Captain A. D. Gillie. Fawley to New York. Observers: the Master and ship's company.

8-9 February 1985. Between these dates, the ship experienced heavy weather as it was passed close to by a depression. The most severe conditions were encountered on 8 February, weather observations were made every hour and extracts from the ship's deck log book for this day appear opposite.

Date and time (GMT)	Wind Dir'n	Force	State of Sea	Dry Bulb (°C)	Pressure and remarks
8th 0100	SW	4	Moderate	10.8	981.3 mb. Overcast with occasional showers. Heavy sea and swell.
0300	SSE	8	Rough	10.8	973.8 mb. Overcast with rain. confused sea and swell.
0500	ESE	10	Very rough	11.1	963.7 mb. 0410, engage hand steering.
0700	SW	9	Very rough	11.3	958.1 mb. 0705, reduce speed to 75 r.p.m., 0715 reduce speed to 70 r.p.m.
0900	W	12+	Very rough	9.0	961.2 mb. Vessel hove to. Overcast. Blinded by driving rain and spray.
1100	W'S	12+	Very rough	7.4	967.6 mb.
1300	SW'W	11	Very rough	9.0	973.7 mb. Vessel hove to. Overcast with rain and hail. Very large seas and swell. Poor visibility due to driving spray.
1500	WSW	10/11	Very rough	10.5	976.5 mb.
1700	WSW	9/10	Very rough	9.8	978.8 mb. Vessel hove to. Cloudy with showers. Very confused heavy swell and seas.
1900	W'S	9/10	Very rough	9.5	982.0 mb. 1957, ship's speed increased to 80 r.p.m.
2100	WSW	7/8	Rough	9.5	982.7 mb. Cloudy with occasional showers.
2300	SSW	6	Rough	9.8	983.3 mb.

On 9 February, the wind continued to moderate, although conditions remained generally overcast with showers, heavy and thundery at times. By 1600, the wind had increased to w'ly, force 9 and the seas again became very rough, but the pressure was rising erratically and hourly observations were discontinued.

Position of ship at 1200 GMT on 8 February: 47° 06'N, 21° 12'W.

Position of ship at 1200 GMT on 9 February: 46° 30'N, 23° 30'W.

WATERSPOUTS

Gulf of Oman

m.v. *Esso Dalriada*. Captain W. D. B. Boler. Ain Sukhna, Suez to the Gulf. Observers: the Master, Mr A. Meeds, 2nd Officer and Mr C. A. Lane, 3rd Officer.

3 January 1984. Between 0445 and 0500 GMT, two waterspouts were observed developing from the same cumulonimbus cloud, at a distance of 6 n. mile on the starboard bow.

They were first noticed as a disturbance on the sea surface, but gradually the 'funnels' extended down from the cloud. One reached about three-quarters of the way down, but then dissipated; the other eventually reached right down to the sea surface. The former lasted for about five minutes whereas the latter lasted for double the time. The cloud base was estimated to be about 600 feet, and the two waterspouts were estimated to be about 0.75 n. mile apart. Later, another funnel was observed developing from the same cloud at an angle of about 45° to the horizontal, but this one did not grow to any length.

At 0515, another waterspout developed from a different cloud and eventually passed down the starboard side of the ship at a distance of approximately 100 m.

It lasted for a total of fifteen minutes from start to finish and this one is pictured opposite page 24.

Weather conditions were: dry bulb 23.8°C , sea temperature 26.0 , pressure 1019.6 mb and wind w's, force 4.

Position of ship: $24^{\circ} 19' \text{N}$, $58^{\circ} 21' \text{E}$.

CLOUD

North Atlantic Ocean

m.v. *Trinidad and Tobago*. Captain N. H. Malpass. Point Lisas to Rotterdam. Observers: Mr S. N. Harris, Chief Officer and Mr S. Hind, 2nd Officer.

25 February 1985. At 1800 GMT, the sky was virtually overcast, there were three oktas of stratocumulus, and above it, a layer of altocumulus which was just beginning to break up. By 1830 the stratocumulus was breaking up into small cumulus and the altocumulus was becoming more semi-transparent, it also seemed to be forming lines. By 1900, the stratocumulus had gone, leaving a few small cumulus and the altocumulus had formed lines covering seven oktas of the sky.

The photograph opposite page 24 was taken at 1900 from the port bridge wing, and facing 290° and with the ship steering 075° . The wind direction at the time was NW'N, force 3, and the lines of cloud bore no relation to the direction of the surface wind.

At 2000, all the medium cloud had gone, leaving one okta small cumulus and one okta cirrus to the west.

Position of ship at 1800 GMT: $37^{\circ} 01' \text{N}$, $30^{\circ} 41' \text{W}$.

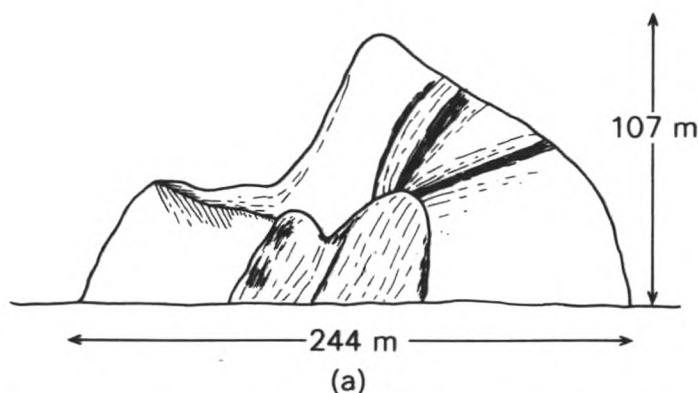
ICEBERGS

Southern Ocean

m.v. *Remuera Bay*. Captain W. F. McCarthy. Port Chalmers to Zeebrugge. Observers: the Master, Mr A. M. Leech, 3rd Officer and Mr G. Smith, Seaman 1.

6 February 1985. At 1800 GMT, an iceberg was clearly detected to the south of the vessel by both the raw radar, at a range of 23 n. mile and the ARPA radar at 22.5 n. mile. At the time of the observation, the visibility was good and the iceberg was seen at a range of 15 n. mile by the naked eye.

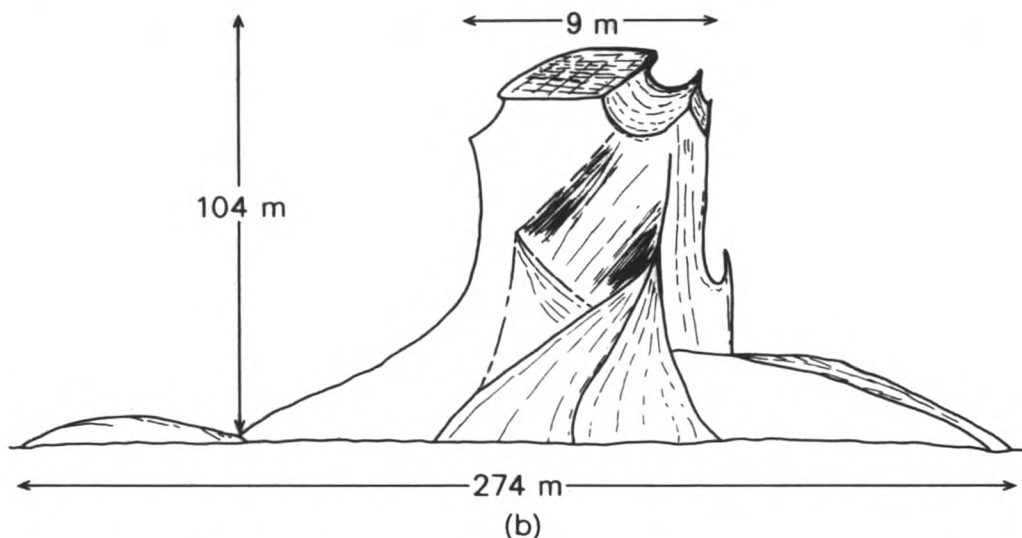
Vertical and horizontal sextant angles were taken to determine the size of the berg, and its dimensions were as shown in sketch (a). The ship passed the berg



at a distance of 12 n. mile and it could be seen to be a very light blue in colour.

Weather conditions were: air temperature 0.7°C , ice bulb -0.1 , sea temperature 1.6 , wind s'ly, force 4–5. Overcast with good visibility.

About two hours later, an iceberg of a similar size to that of the first was sighted. Once again, an excellent response was obtained from both radars when the berg was detected at a range of 24 n. mile; it was observed visually at 15 n. mile. The ship passed this berg at a distance of 9 n. mile and as shown in sketch (b), it differed from the first in that it had a large tower in the centre



which had a tabular top. Whilst the upper part of the berg was a chalky-white in colour, its lower part was very light blue/green. Weather conditions at this observation were: air temperature 0.8°C , wet bulb 0.5 , sea temperature 1.4 , wind ssw, force 5–6. Overcast with occasional heavy snow showers.

It had been our intention to steer a great circle course to 60°S , 135°W , thence rhumb-line to 95°W , and again a great circle to Cape Horn. At 1730 GMT, it was decided by the Master to discontinue the south-ward passage considering the prevailing circumstances, and the vessel took up a parallel sailing. A navigational warning of all icebergs sighted was sent out by the Master.

Position of ship at 1800 GMT: $58^{\circ} 58'\text{S}$, $149^{\circ} 27'\text{W}$.

Position of ship at 2000 GMT: $58^{\circ} 57'\text{S}$, $147^{\circ} 50'\text{W}$.

DOLPHINS

South China Sea

m.v. *Troll Lake*. Captain E. D. Somes. At Hsia-men. Observers: the Master and ship's company.

24 January 1985. During the shifting from the anchorage to the berth, two pinkish-white dolphins were observed, and then an additional three as we moved further into the harbour. These three travelled in the bow wave for about one mile, sometimes leaping out of the water. One was a mottled grey colour, one quite white, and one a pinkish-white. They were about 1.2 m in length with a bottlenose, and tail similar to any other dolphin. The overall appearance was of albino dolphin.

They were seen again on 30 January when the vessel was alongside, and were travelling slowly with their bottlenoses and dorsal fins coming out of the water.

The Pilot could not explain what they were, but said that locally they are known as 'Amoy Fish'.

Position of ship: $24^{\circ} 27'\text{N}$, $118^{\circ} 04'\text{E}$.

Note. Mr D. A. McBrearty, of the Department of Anatomy, University of Cambridge, comments:

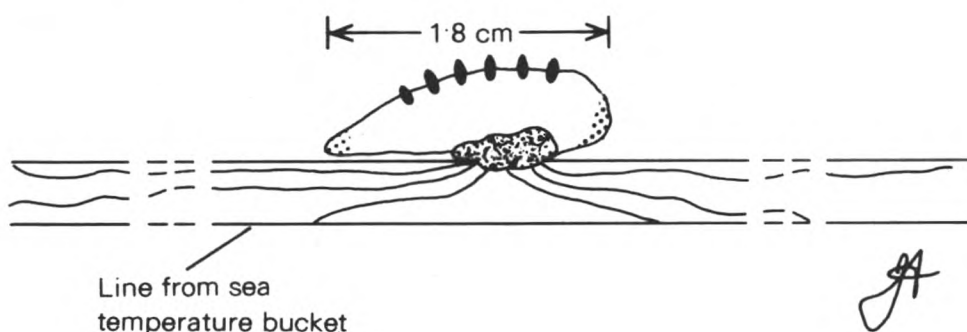
“These “Amoy Fish” are not fish at all, they are mammals and specifically Indo-Pacific Humpback Dolphins (*Sousa chinensis*). They are a coastal species found throughout south-east Asia, the Persian Gulf, east Africa and along the coast of northern Australia and Queensland. There are widely differing forms in the various areas with the differences being mainly in the shape of the dorsal fin and in the colour pattern. All have a long beak, all have a rather prominent hump faired into the bottom leading edge of the dorsal fin except the Australian form, which has a fin of almost triangular shape. The colour ranges from a rather dull lead-grey in the east African form, to a light grey Australian form and the almost creamy-white dolphin found along the coast of China and off Borneo. The new-born young are generally much darker than the adult dolphins and the creamy colour comes only with maturity. Often the tips of fins and flukes have a pinkish tinge. They are not true albinos in that the eyes are not pink, they are dark.’

PORTUGUESE MAN-OF-WAR

South Atlantic Ocean

m.v. *St Helena*. Captain R. H. Wyatt. St Helena to Cape Town. Observers: the Master, Mr D. A. Wheal, Chief Officer, Mr V. S. Moran, 3rd Officer and Mr J. Harrison, Cadet.

11 February 1985. At 1800 GMT whilst the vessel was stopped and drifting during repairs, the usual weather observations were taken. When the sea temperature bucket was being recovered, a small jelly-fish was discovered clinging to the rope. It was thought to be a Portuguese man-of-war.



As shown in the sketch, it consisted of a crescent-shaped sac with tentacles protruding from its base. The sac was a transparent blue colour with opaque blue and green ends; along the top of it were six blue ‘lumps’. The tentacles were wrapped around the rope, were blue in colour and of cotton thread thickness measuring 26–32 cm in length. The ‘body’ was about 1.8 cm long and 1.0 cm wide.

Position of ship: 22° 57’S, 02° 39’E.

Note. Dr F. Evans, of the Dove Marine Laboratory, University of Newcastle upon Tyne, comments as follows:

“The identification of this animal as a Portuguese man-of-war is correct. At the size noted, they are sometimes called “bluebottles”, for obvious reasons. Do not be deceived into thinking that being young they are harmless; the pain of a bluebottle sting resembles that of a cigarette burn. The sting of a fully-grown Portuguese man-of-war is of course worse, sometimes requiring hospitalization. Reports of these animals are always welcome; may I reiterate that, while the spotting of rare species is exciting, it is the animals like this one that are commonly seen which are the most important, just because they are common. Your reports help us to keep track of the fluctuating distribution and seasonality of prominent species as well as rare ones, and are received with gratitude. With research vessels, like merchant ships, becoming more scarce, we need your reports.’

KRILL SWARM AND BIRD ACTIVITY

Bransfield Strait, Antarctica

R.R.S. *John Biscoe*. Captain C. R. Elliot. In the vicinity of the South Shetland Islands, participating in the Second International Biomass Experiment. Observers: the Master, Mr R. C. Plumley, Chief Officer, Mr K. Hartshorn, A. B., Mr N. Flashman, E.D.H., and scientists on watch.

19 January 1985. Between 0800 and 0900 GMT, a pronounced increase in seabird activity was noted. Instrument readings from the scientific echo sounder and ship's sonar indicated vast amounts of krill (*Euphausia superba*). A team of American ornithologists maintained a bird count to about 0.5 n. mile out from either side of the ship during the run of activity of 10 n. mile. The estimated count was as follows: Chinstrap Penguins (*Pygoscelis antarctica*) 5, Black-browed Albatross (*Diomedea melanophris*) 7, Light-mantled Sooty Albatross (*Phoebastria palpebrata*) 1, Cape Pigeon (*Daption capensis*) 4200, Antarctic Fulmar (*Fulmaris glacialisoides*) 4000, Prion (*Pachyptila* spp) 10, and Black-bellied Storm Petrel (*Fregetta tropica*) 3. The Cape Pigeons and Antarctic Fulmars were taking krill from just below the surface by diving down to about 30 cm.

This event continued for 10 n. mile and birds were observed to a distance of at least 3 n. mile out on either side of the ship, the preponderance of birds decreased sharply when the krill layers dropped away. Dry bulb 1.8°C, sea temperature 1.7, sea state slight.

20 January. Observers: the Master, Mr J. M. Jenkins, 3rd Officer and scientists on watch.

At about 1330 as the ship was leaving Antarctic Sound at the northern entrance, we came upon an area with an unusually high concentration of Adelie Penguins (*Pygoscelis adeliae*); they appeared to be foraging and were clustered in 'rafts' of 30–2000 birds. Whole rafts, or portions of them were seen to submerge or reappear at the surface as one unit. Within 300 m of one side of the ship, over a distance of 4 n. mile, a count of 2560 penguins was made by the team of American bird observers, who also estimated that there may have been as many as 10 000–15 000 birds present.

The echo sounder and sonar on the bridge were both disrupted by the concentration of penguins and also krill for which they were foraging. Our scientific sounder's trace revealed that the number of penguins was closely correlated with an area of krill (estimated density of 100 krill per cubic metre) positioned over a slight rise of the edge of the continental slope bordering Bransfield Strait. Some discolouration of the sea was also observed. Sighted too, but several minutes before the penguins, were three or four Minke Whales (*Balaenoptera acutorostrata*). Dry bulb 0.7°C, sea temperature 1.0, sea state calm.

Position of ship on 19 January: 61° 50's, 56° 50'w.

Position of ship on 20 January: 63° 10's, 57° 03'w.

Note. Captain A. S. Young, of the Royal Naval Birdwatching Society, comments as follows:

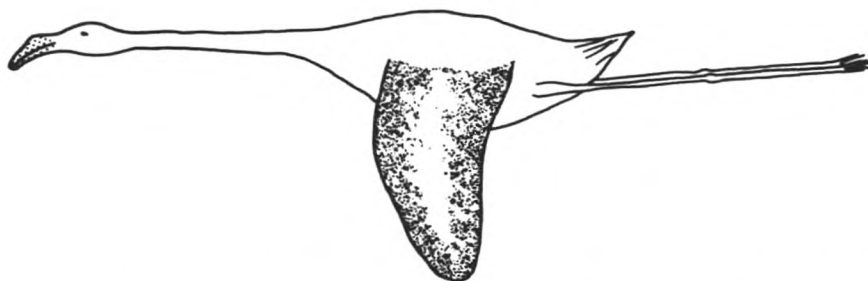
'I find this a very interesting report, and having an obvious scientific basis, of considerable value. It certainly emphasizes the relationship between food supply and bird concentration. The list of species is impressive. I envy the luck of the U.S. ornithologists, their final report must make very interesting reading. Many thanks, gentlemen of the *John Biscoe*.'

BIRDS

Western Mediterranean Sea

m.v. *Discovery Bay*. Captain B. V. Chipperfield. Livorno to Tilbury. Observers: Mr R. Anderson, 2nd Officer, Mr K. J. Gaughan, 2nd Radio Officer and Mr G. Maher, Seaman.

15 January 1985. At about 1500 GMT the Second Officer noticed the bird shown in the sketch approaching the ship. The flight-pattern and shape of the bird was unlike anything previously observed at sea. As the bird passed the port bridge wing at a distance from the ship of about 100 m, it was clearly distinguishable as a flamingo. It circled the ship on-and-off for approximately



thirty minutes, but was not seen to land on the ship. Several times it was harassed by two 'normal' gull-like birds, the species of which could not be identified.

The flamingo had quite a plump body with a short, stubby tail and the legs were a delicate pale pink as were the neck and body. Its beak was a dark, indeterminate colour whereas its wings were bright pink on the inboard half, paling towards the tips and with a broad black/very dark border on both the leading and trailing edges. The bluff, down-turned shape of the bill, typical of flamingos, was clearly visible.

In flight, the neck was held horizontally with the legs trailing likewise. The bird was quite large and presumably fully grown, it had a powerful flight and appeared to overtake the ship effortlessly. The bird was last seen heading north and into the gloom. Where did it come from?

The weather at the time was dull and overcast with continuous drizzle and the sea was rough with a moderate N'y swell.

Position of ship: 40° 05'N, 05° 00'E.

Note. Commander M. B. Casement, Chairman of the Royal Naval Birdwatching Society, comments:

'An excellent sketch and description — unmistakably a flamingo (*Phoenicopherus ruber*). This species breeds in southern France, in the Rhône valley/Carmargue area and, as reported in the United Kingdom press, the abnormally cold weather in January 1985 froze much of their shallow lagoons where they breed. Many flamingos died of starvation or were trapped in the ice. I suspect that this individual was probably one of those looking for alternative feeding areas; the weather being overcast (i.e., the bird could not see the sun or stars), it probably had lost its navigation sense and so was attracted by the ship.'

North Pacific Ocean

m.v. *La Chacra*. Captain J. W. Murray, Cedros Island, Mexico to Kashima. Observers: the Master, Mr C. Ratcliffe, A.B., and ship's company.

15 March 1985. During the several days prior to observation, there had been 15–20 albatrosses following the ship. They would fly and glide the length of the

ship, using the different currents of air associated with the movement of it to assist them and it was interesting to watch how the birds used the currents to their full advantage. At 2100 GMT, five of the albatrosses decided to land on the ship, which was found by all to be a rather peculiar turn of events because once they had landed it was impossible for them to take off again. They would waddle along the main deck and make the effort to fly but without any success. At first, we were under the impression that the birds were injured, but closer inspection proved that this was not the case.

It was suggested by one of the A.B.s, who had come across this situation once before, that we put the birds over the side of the ship so that they could get airborne again. We managed to catch one of them and put it over the side, whereupon it immediately took flight, so we did the same for the remaining birds and produced the same result. All of them resumed their constant vigil flying around the ship.

The albatrosses had pure white bodies with black wings which had a slight brown tinge to them; there was also a trace of white mixed in with the black and we thought this might have something to do with the age of individual birds as it did not show on all of them. Their beaks were very strong and hooked downwards for feeding purposes, the wing-span of each bird was about 2 m and the height from head to webbed feet was approximately 35 cm.

It is a mystery why the birds landed on the ship when it was obvious to all on board that they were helpless to take off again.

The weather conditions for the voyage to date had been predominantly favourable with clear skies and occasional traces of small cumulus clouds. During the period, the winds were ENE, force 2-3.

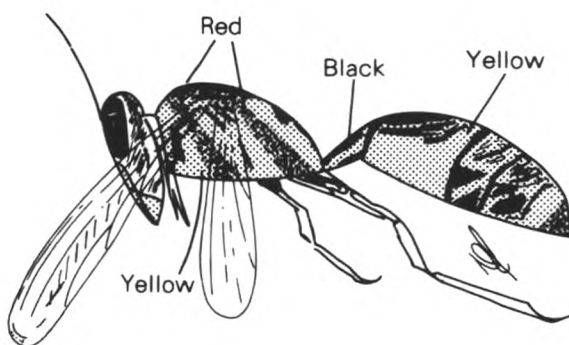
Position of ship at 1800 GMT: 30° 36'N, 151° 48'W.

INSECTS

Equatorial Western Atlantic

m.v. *Appleby*. Captain C. B. Tingle. Mobile to Richards Bay. Observers: Mr N. D. Ferguson, 2nd Officer, Mr P. B. Davis, Radio Officer and Mr M. Fidler, 2nd Engineer Officer.

13 January 1985. At 1820 GMT a wasp-type insect flew into the wheel-house. In addition to the usual colouring of yellow and black bands, the insect also had red patches on its body as shown in the sketch. The rear legs were greatly



elongated when compared to those of a common wasp, and they looked quite powerful unlike the forelegs which were small and kept tucked under the body. In flight, the rear legs were trailed behind. Its front wings were darker and more heavy than its rear pair which were nearly transparent. There were three small, black dots on the forehead and the wasp measured 25 mm in length, with a wing-span of 35 mm.

It was thought that the wasp had not come from Brazil since the vessel was 300 n. mile north of Cabo Orange and the wind had been constantly ENE'ly, but was more likely to have come aboard three days prior to observation when the ship passed through the Windward Islands.

Position of ship: 09° 04'N, 50° 12'W.

Note. Mr M. C. Day, of the Department of Entomology, British Museum (Natural History), comments as follows:

'The drawings strongly suggest a tropical social wasp of the genus *Polistes*. The commonest and largest Neotropic species are infamous as "Jack Spaniard" throughout the Caribbean. However I cannot match the colour pattern exactly with any species in our collection. It is thus possible that it is a species from some other region which has "hitched a lift" on the ship, perhaps in a nest in a ventilator or some inaccessible place, perhaps as a larva fed to maturity during a stay in port somewhere else, then dormant in the pupal stage during the voyage.'

'Alternatively, it may be a "mud-dauber" of the subfamily Euminae, to which the same comments would apply.'

BUTTERFLY

Indian Ocean

m.v. *Cardigan Bay*. Captain R. J. Bland. Port Kelang to Southampton. Observers: Mr N. M. V. Salmon, 2nd Officer and Mr B. A. Mullan, Radio Officer.

27 March 1985. At 0430 GMT a live butterfly was found on board. It remained long enough to be photographed by the Radio Officer, but then flew off. The butterfly is pictured opposite page 8.

Position of ship: 06° 00'N, 95° 00'E.

Note. Mr Campbell R. Smith, of the Lepidoptera Section A, of the British Museum (Natural History), comments as follows:

'This is a Papilionid (Swallowtail) butterfly, *Graphium agamemnon* L. The species is very wide ranging, from northern India to Indonesia as far east as Sulawesi, Sumba and Sumbawa, and in the Philippines. It is known to be a strong flyer and may have been migrating or blown off course when found off north-west Sumatera.'

BEES

Caribbean Sea

m.v. *Saxonia*. Captain J. G. Rosie. Puerto Armuelles anchorage. Observer: Mr L. Rigby, 3rd Officer.

17 January 1985. During the afternoon a large number of bees was observed swarming around the port bridge wing. On a closer, tentative inspection, they were found to be concentrated under the after awnings, forming several small colonies with approximately one hundred bees in flight 'buzzing' around. After about ten minutes, they had reformed into one large colony with only a few flying. They seemed to be too preoccupied with their hive to sting anyone. I could stand among them and not be stung, even on approaching their hive. The hive was shaped like an inverted cone having a diameter of about 39 cm and a vertical depth of 27 cm, although it changed shape frequently. Several bees in groups, fell the 3 m to the deck beneath, crawled around for a few minutes (perhaps stunned after their 'freefall') and then flew back to the colony. On

forming the first hive, there was an entrance hole at the top which measured about 5 cm in diameter and inside was a centre core of bees. The bees on the outside seemed to form a protective casing for those in the core. Late in the afternoon, the colony resembled a three-sided pyramid with no entrance hole, the bees departed during the evening, leaving behind them a white, sticky substance, presumably honey or beeswax.

Weather conditions at the time were as follows: air temperature 28.7°C, wet bulb 24.2, barometric pressure 1011.9 mb with light airs.

Position of ship: 08° 17' N, 82° 52' W.

BIOLUMINESCENCE

Eastern North Atlantic

m.v. *Fort Rouge*. Captain J. W. Rogers. Cartagena to St Croix. Observers: Mr S. Collins, 2nd Officer and Mr S. H. Barker, 3rd Officer.

23 March 1985. From 2200 GMT until daylight on the 24th, the vessel passed through an area of minor bioluminescent activity. The 'creamy' part of the ship's bow wave and wake took on a greenish-white colour, which when viewed through binoculars, could be seen to be large quantities of small pin-pricks of light. The individual points glowed with colours ranging from white to green to blue. When the Aldis lamp was shone on to the wake, the activity increased somewhat, though at no time could it be called bright — a soft glow would be more descriptive.

In addition to this activity, outside the edge of the ship's wake, where the water was disturbed but not aerated, there were several (at any one time) very bright points of light. Their brightness was something akin to that of a ship's lights when seen about 10 n. mile away in good visibility. The colour of these points was, in the main, greenish-blue-cream, though a few were observed to be amber, and on one occasion, a very definite blood red. The effect of the Aldis lamp on this luminescence was to increase the apparent light. No activity was observed the following night.

Weather conditions at the time were: dry bulb 18.0°C, sea temperature 19.1, no wind, cloudless, moonless sky.

Position of ship: 29° 40' N, 26° 45' W.

Note. Dr P. J. Herring, of the Institute of Oceanographic Sciences, comments as follows:

'The point sources of light in the bow wave were probably small jellies, the commonest source of bright point luminescence, and they may also have been responsible for some of the flashes away from the vessel's side. However, the amber and red points (as well as some blue and green) were almost certainly reflections from the eyes of lanternfish or even squid. True red luminescence is exceedingly rare. This would also account for the increase in these flashes in the Aldis lamp.'

Arabian Sea

m.v. *Mentor*. Captain J. P. Wishart. Karachi to Suez. Observer: Mr K. P. Widdowson, 3rd Officer.

5 January 1985. Between 1805 and 1920 GMT, the ship's wake was very brightly illuminated as each wave crest formed and broke into white water. The wind had dropped from NNE, force 3 to calm in 5–10 minutes and there were no

swell waves, thus the only disturbance of the water was that caused by the ship. The colour of the waves was consistently bright green and the phenomenon only formed along the ship's side where the water was disturbed and at the bow just forward of the accommodation. When an Aldis lamp was shone onto the sea-surface, initially, minute particles were observed to glow randomly within the beam of the lamp. No wheels or streaks were observed. However, it was noticed that the sea surface was covered in a brown scum, as if it were weed or the result of a tanker discharging in the area. This was probably related to the fact that the sea was suddenly so calm at the time of the sighting.

There were 5–7 oktas of low cloud (type 2) present and the moon was at its fullest.

Position of ship: 22° 10'N, 63° 20'E.

BLUE FLASH AND OROGRAPHIC CLOUD

South African Waters

m.v. *Kildare*. Captain R. O. McD. Wilson. Norfolk, Va. to Richards Bay. Observers: the Master, Mrs S. Wilson and Miss S. J. Miller, 3rd Officer.

16–17 February 1985. At 1749 GMT, whilst in the waters off Cape Town on 16 February, we observed the 'flash' phenomenon at sunset. The setting sun was watched through binoculars and when the disc was reduced to its smallest limb by the horizon, the edges of it turned emerald green a split second before the final portion turned peacock blue as it too disappeared. The conditions at the time were: air temperature 20.8°C, wet bulb 17.6, pressure 1013.0 mb and there was one okta of small cumulus cloud. Visibility was excellent, being more than 27 n. mile.

The following day as the vessel was approaching Cape Town from the north-west, we watched orographic cloud forming over Table Mountain. Small cumulus clouds developed first, these increased to form bands resembling stratocumulus and eventually, virtually the whole mountain area was obscured by this cloud, capped by lenticular-type layers. A photograph of the scene appears opposite page 8.

Position of ship on 16 February: 31° 51'S, 14° 58'E.

Position of ship on 17 February: 33° 36'S, 17° 42'E.

Note. The following explanation of the green flash appears in *The Meteorological Glossary*.

On some occasions the last glimpse of the sun at sunset, or the first glimpse at sunrise, is a brilliant green — the 'green segment' — lasting a few seconds. On still rarer occasions a 'green flash' or 'green ray', also lasting a few seconds, shoots above the horizon from the upper limb. The explanation is the greater refraction of the short waves (violet, blue, green) than of the long waves (red) of white sunlight, coupled with the greater degree of Rayleigh scattering (scattering of electromagnetic radiation) experienced by the violet and blue rays. In a hazy atmosphere such differential scattering may not be appreciable and the flash may then appear blue or violet. It is probable, though not yet confirmed, that an unusual degree of refraction, such as occurs with a low-level inversion of temperature, is required for the phenomenon.

AURORA AUSTRALIS

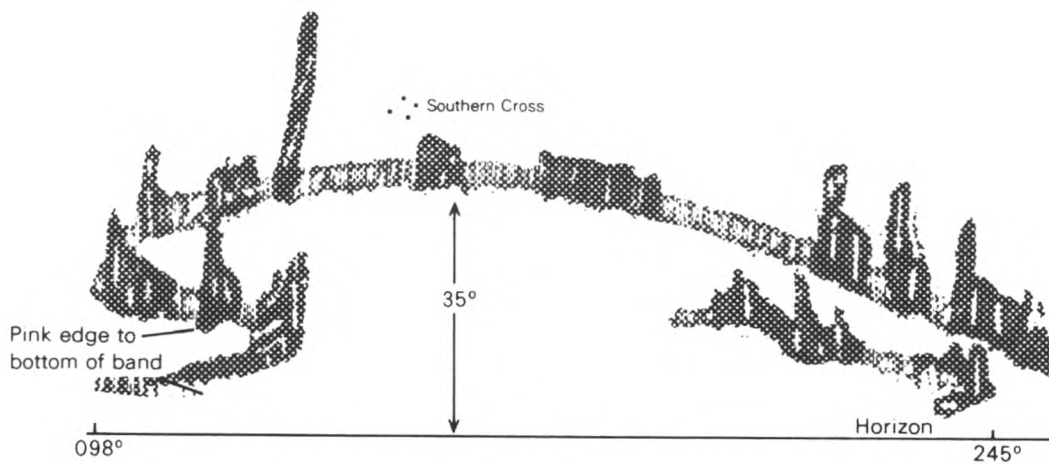
Southern Ocean

m.v. ACT 7. Captain D. M. McPhail. Rotterdam to Melbourne. Observers: the Master, Mr A. Hillier, 2nd Officer, Mr D. G. Robbie, 3rd Officer, Mr W. P. Mitchell, Extra 3rd Officer and bridge watchkeepers.

5 March 1985. At 1345 GMT, a band of light was observed to the south, taking the form of a shallow arc of approximately 30° above the horizon. It appeared quite suddenly and resembled wisps of thin cirrus cloud illuminated by the moon, which was quite low to the north.

Two or three minutes after the light was first noticed, the band brightened rapidly and took the form of a definite arc some 35° above the horizon, and it was realised that an auroral display was about to start.

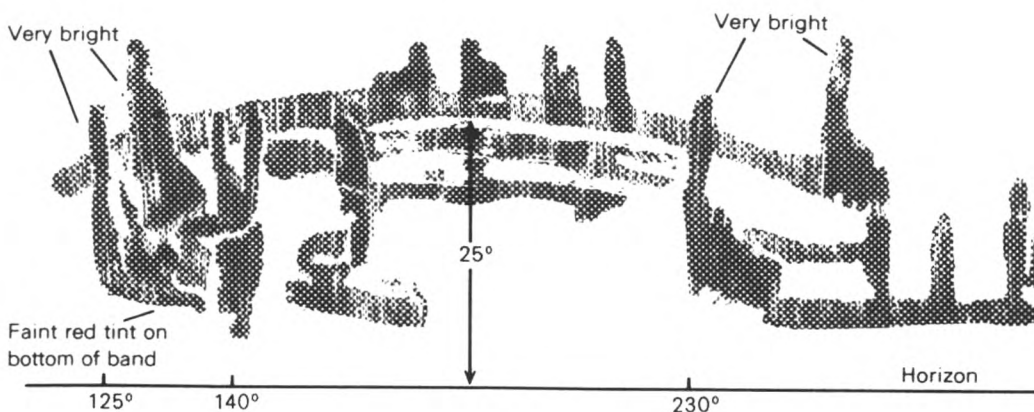
Activity increased rapidly and by 1354 the display was as shown in the first sketch. Initially, two homogeneous arcs bright green in colour were seen, but



these quickly changed into rayed arcs, then the upper one became a rayed band. At this point, the brightness classification as given in the *Marine Observer's Handbook* was 'brilliant'. The bottom of the rayed band was pink in colour and the rays of the arc travelled along its length in a general W-E direction, although occasionally changing course abruptly.

At 1410, the rays vanished only to be replaced by four homogeneous bands and arcs, the bands containing bright patches which moved along their length. It was also noticed that the aurora had decreased in altitude to about 25° .

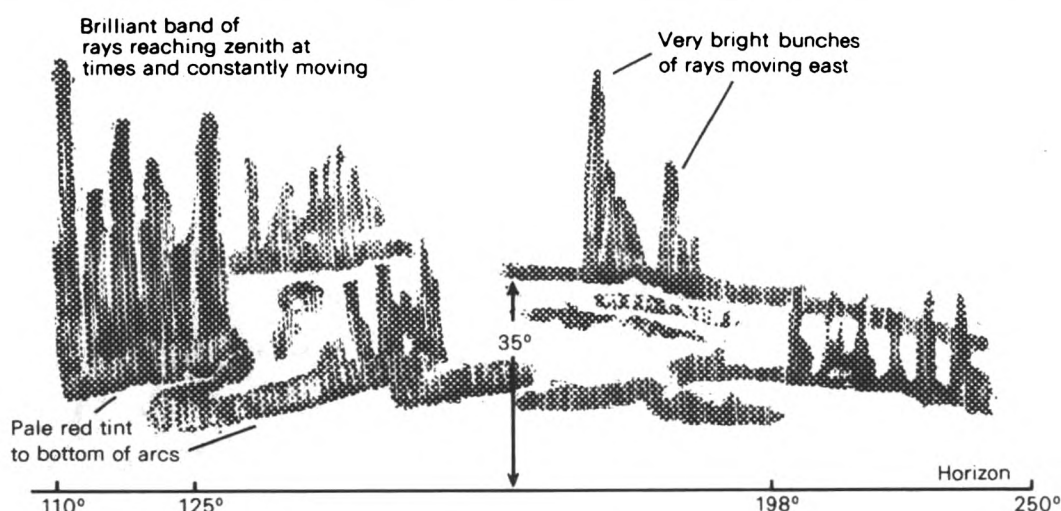
At 1422, there was a sudden increase in activity; rayed bands formed again at different altitudes, the highest of which was 25° and intense activity was seen on a bearing of 140° . The effect is shown in the second sketch. In this direction and



close to the horizon, the rays were brightest, their general colour was bright green although there appeared to be a layer of red along the lower edge of the band in this area. There was continual movement of the rays and 'flaming' activity would be the best way to describe it. During the next ten minutes, the display started to die down; the main arc was visible only as a white glow at an altitude of 25° , but the others were sinking towards the horizon and there was still much activity in the direction of 140° .

At 1435, all flaming activity stopped and the display became 'quiet' with three homogeneous arcs similar to those witnessed earlier, the main one sustained its previous altitude, whilst the remainder were much closer to the horizon.

At 1450 the activity flared up once more. There were several arcs and bands, all rayed and visible at the same time, these are shown in the third sketch. They were of a bright greenish-yellow colour and as before, appeared to be red along



the edge nearest to the horizon. Some of them seemed to pass through the zenith, especially those bearing ESE. This burst of activity lasted for five minutes during which time the rays were continually moving along the bands which were themselves always changing shape.

Between 1458 and 1528, the display decreased in intensity once more, but at 1620 parallel bands of what was thought to be whitish-yellow cloud were observed in an arc from approximately 110° – 270° and passed directly overhead. They remained stationary and of moderate brightness for about five minutes and then waves began to form in them; by 1628 they had increased in intensity and formed hooked shapes. During the next half-hour, virtually all the forms of aurora described in the *Marine Observer's Handbook* were observed. These usually started off as weak patches of auroral arcs which would suddenly flare up into rays for a few seconds before fading away.

At 1700, clouds obscured the sky, however for the rest of the night the display was visible when there was clear sky to the south. One particular incident occurring at 1819 was notable because of the strong intensity and differing colours, a homogeneous arc flared up for approximately ninety seconds into a rayed arc with green and yellow rays fluctuating rapidly.

Position of ship: $48^\circ 38'S$, $114^\circ 07'E$.

SATELLITE LAUNCH DEBRIS

Equatorial North Pacific

m.v. *Aotea*. Captain R. Wood. Tokyo to Lyttelton. Observers: the Master, Miss J. Stanley, 3rd Officer and L. Boyd, A.B.

24 January 1985. At 1205 GMT two lights of increasing luminosity were observed bearing 185° and at altitude 33° . After five seconds, the lights broke up into twelve separate parts, presumably after passing through the Earth's atmosphere.

These lights slowly moved across the sky, at the same altitude, being blue, green, orange and white in colour with a very prominent after-glow trailing behind each one. At this stage, the lights were extremely bright, having a star magnitude of approximately -5.0 .

After one minute, the lights were on our port bow, at the same altitude heading 030° . The luminosity appeared to decrease at this point, but the after-glow remained as bright as before.

We watched them for approximately another minute until they disappeared over the horizon leaving only the after-glow. This remained on the track of the lights for ten minutes before fading away completely.

Two minutes sounds like a long time to observe something of this nature, and it seemed like an eternity to us. It was a fantastic sight and we can only assume that it was a meteorite entering the Earth's atmosphere. We understand however, that an American space-shuttle was launched close to the date of this observation so perhaps the lights were connected with this event?

Position of ship: $03^{\circ} 40' \text{N}$, $151^{\circ} 30' \text{E}$.

Note 1. The *Aotea* is a New Zealand Selected Ship.

Note 2. The New Zealand Meteorological Service forwarded this report to the National Observatory of New Zealand, the Carter Observatory who in turn passed it to the Smithsonian Institute in Washington, D.C. for further explanation. Janet W. Crampton, Museum Technician (Geology), Scientific Event Alert Network, commented:

'The object that created the spectacle was the rocket body of Cosmos 1625 (U.S.S.R.), a satellite that had been launched on 23 January 1985. The staff at the North American Aerospace Defense Command (NORAD), at Colorado Springs, Colorado, had predicted the re-entry for 24 January at 1209 GMT in position 19.1°N , 158.2°E .

'Those on the ship saw the object breaking up as it travelled through the atmosphere. Re-entries tend to be spectacular events.

'The officers at NORAD are grateful for this report, they like having their predictions confirmed.

'Keep watching, the next fire-ball may drop a meteorite at your door (or on your deck).'

Halley's Comet

By R. J. LIVESEY

(British Astronomical Association)

It was that great investigator of planetary orbits, Johannes Kepler, who began the mathematical studies of cometary motions and put forward ideas, which for his times, were similar to present day thought. His work began on the observations of the comet of 1607. Giovanni Borelli in 1665, started work on the attempt to resolve the theory of cometary orbits while Johannes Hevelius and his pupil George Doerffel did likewise. It fell to Edmond Halley in conjunction with his great friend Sir Isaac Newton to apply the new theory of gravity to the solution of cometary orbits. Arising out of the studies of the comets of 1682, 1607 and 1531, Halley came to the conclusion that they were probably one and the same comet. This led him to the famous prediction that the comet would next appear in 1758. The date of nearest approach to the sun, the perihelion, was estimated to be 15 April 1759, with a probable error of one month. The actual observed date was 13 March 1759. The lack of precision was owed to the fact that the effects of all the planets upon that comet had not been taken into account, the planets Uranus, Neptune and Pluto not then having been discovered.

Edmond Halley died in 1727 and did not live to see his mathematical work vindicated in the face of his critics. Although comets are now named after their discoverers, Halley's name will be forever linked with that of the comet of 1759 and its various apparitions. The importance of Halley's work was that it paved the way clearly for computational astronomy in the field of what is known as celestial mechanics, soundly based on the theory of gravity.

We can trace back the apparitions of Halley's comet to at least 240 B.C., with the possibility that the observations made by the Chinese record it back to 466 B.C.. The comet is enshrined on the Bayeaux Tapestry which records the history of Duke William's invasion of England from Normandy. The comet was also prominent in 141 A.D., and in 1910 A.D. when the Earth brushed through the comet's tail. The table lists the known appearances of Halley's comet. Apparitions of the comet may be spectacular, as on the occasions below, or they can go virtually unnoticed. The nature of the apparition depends upon the relative positions of the sun, Earth and the comet in space at the time the comet makes its closest approach to the sun, at perihelion. If the Earth and perihelion are on the same side as the sun, then we shall be relatively close to the comet at its brightest, but if perihelion is on the far side of the sun from us, then we shall be at some distance from the comet and at the same time, the presence of the sun in the sky may hinder observations.

The known appearances of Halley's Comet

1986 A.D.	1222 A.D.	451 A.D.
1910	1145	374
1835	1066	295
1759	989	218
1682	912	141
1607	837	66
1531	760	11 B.C.
1456	684	86
1378	607	163
1301	530	240

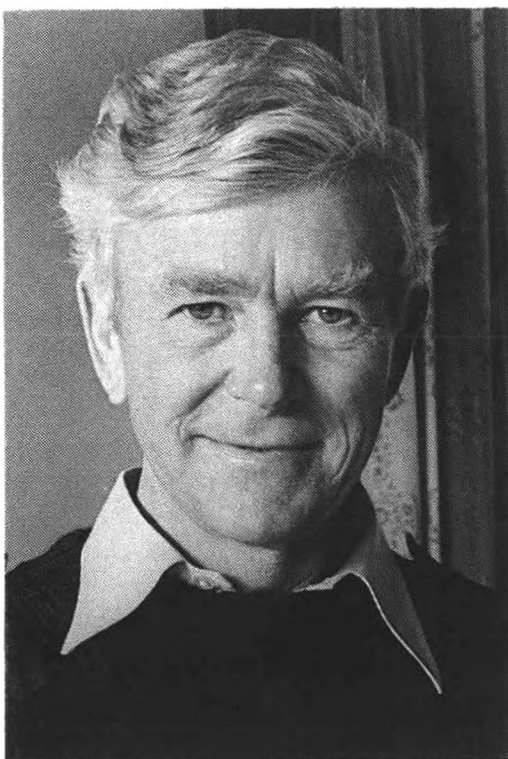


Photo by A. Meeds

The last waterspout observed from m.v. *Esso Dalriada*. (See page 11)



Altocumulus formation observed from m.v. *Trinidad and Tobago*. (See page 12)



Photograph by courtesy of the Whitstable Times.

Captain Basil S. Biggs (*See* pages 29 and 44)



m.v. *Trinidad and Tobago*, sister ship to m.v. *Harold La Borde*. (*See* page 41)

Although the arrival of Halley's comet will generate considerable excitement in professional scientific and amateur astronomy circles, this coming apparition is not likely to be a spectacular event because of the positioning of perihelion relative to ourselves. It is to be hoped that the general public, especially in the Northern Hemisphere, will not feel let down after the build-up they have received from the media. The calculations predict that the comet is to reach a magnitude of 5.9 by 31 December 1985, just visible to the naked eye in good seeing conditions. Perihelion will be on the far side of the sun on 9 February 1986 at a distance of 1.55 astronomical units (a.u.*) from it.

Comet Halley travels out as far as the orbit of Neptune during its 76-year circumnavigation of the solar system. Thus at its farthest distance from the sun, it is at a range of 30.1 a.u. and was last in that position in 1948. Some seventy-one years of the comet's orbital period are spent beyond the orbit of the planet Saturn at a distance of 9.5 a.u. from the sun and only eighteen months inboard of Jupiter's orbit at a range of 5.2 a.u. In accordance with the theory of gravity, the comet moves most slowly at its greatest distance from the sun and reaches its maximum velocity at perihelion with respect to the solar system.

The comet was first observed during the present apparition on a photograph taken in 1982 by the giant 5-metre diameter Hale telescope at Mount Palomar in the U.S.A. The comet was then at a distance of 11.0 a.u. from the sun. In November 1984 it was still at 7.0 a.u. and fainter than nineteenth magnitude, that is, it was then some 158 000 times less bright than it would have been if it were just visible to the naked eye. At that distance, only the nucleus or true body of the comet exists. The nucleus is very small and star-like, and is thought to consist of frozen gasses mixed with meteoric dust. This is known as Whipple's theory of the 'Dirty Snowball'. We still do not know of what precisely a comet is made, and it is for this reason that space probes have been despatched by the European Space Agency, Russia and Japan to attempt to answer this question. Unfortunately, the U.S.A. has cancelled its programme for economic reasons.

When a comet approaches the sun, some of the material contained in the nucleus is melted or evaporated off and forms a fuzzy cloud around the nucleus called the coma. This grows in size and in due course declines again after perihelion. Two tails may form, the one a dust stream which is relatively featureless and bends out in a curve as the individual particles go into their separate orbits around the sun; the other tail contains electrified particles or ions and is straight in form. In telescopes and astronomical photographs, this tail may be found to be highly structured. The dust tail is caused by solar radiation, while the tail of electrified particles or ions is caused by the wind of solar particles and their associated magnetic fields. The tails always point away from the sun with respect to the comet. Depending upon the geometry of the relative locations of the sun, Earth and comet, it may appear that the comet has tails going in different directions, but this is purely an optical effect. A typical example was the appearance of comet Arend Roland on 25 April 1957. Ion tails are found in comets whose minimum distance (heliocentric) from the sun at perihelion reduces to 1.5 – 2.0 a.u. The dust tails are visible due to reflected sunlight. The ion tails glow, like the aurora, due to distinct reactions of their constituent particles which emit visible radiation.

* An astronomical unit is the mean distance from sun to Earth and is used as a unit of length in solar system studies.

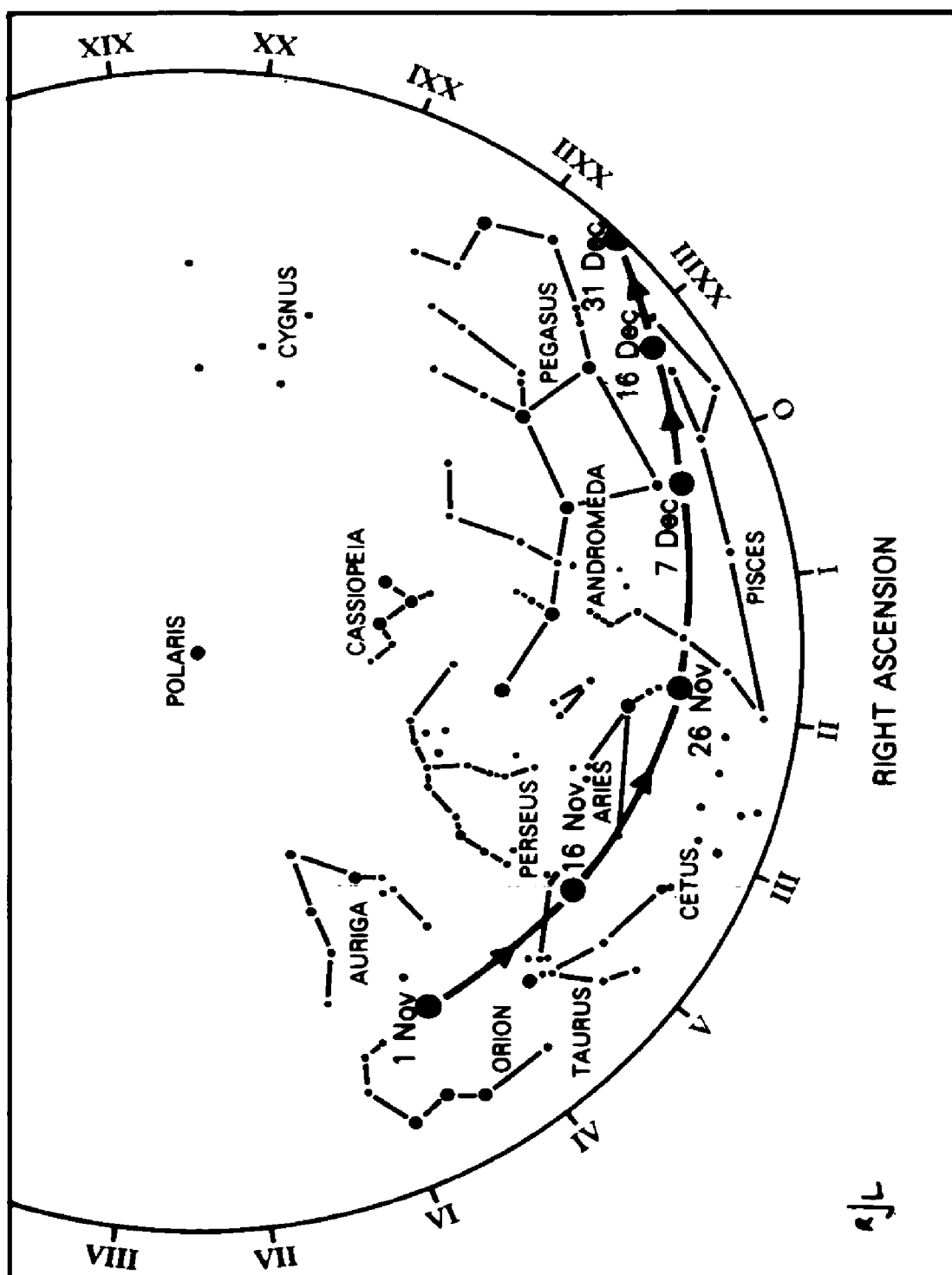


Figure 1. Predicted path of Halley's Comet, 1 November - 31 December 1985, Northern Hemisphere.

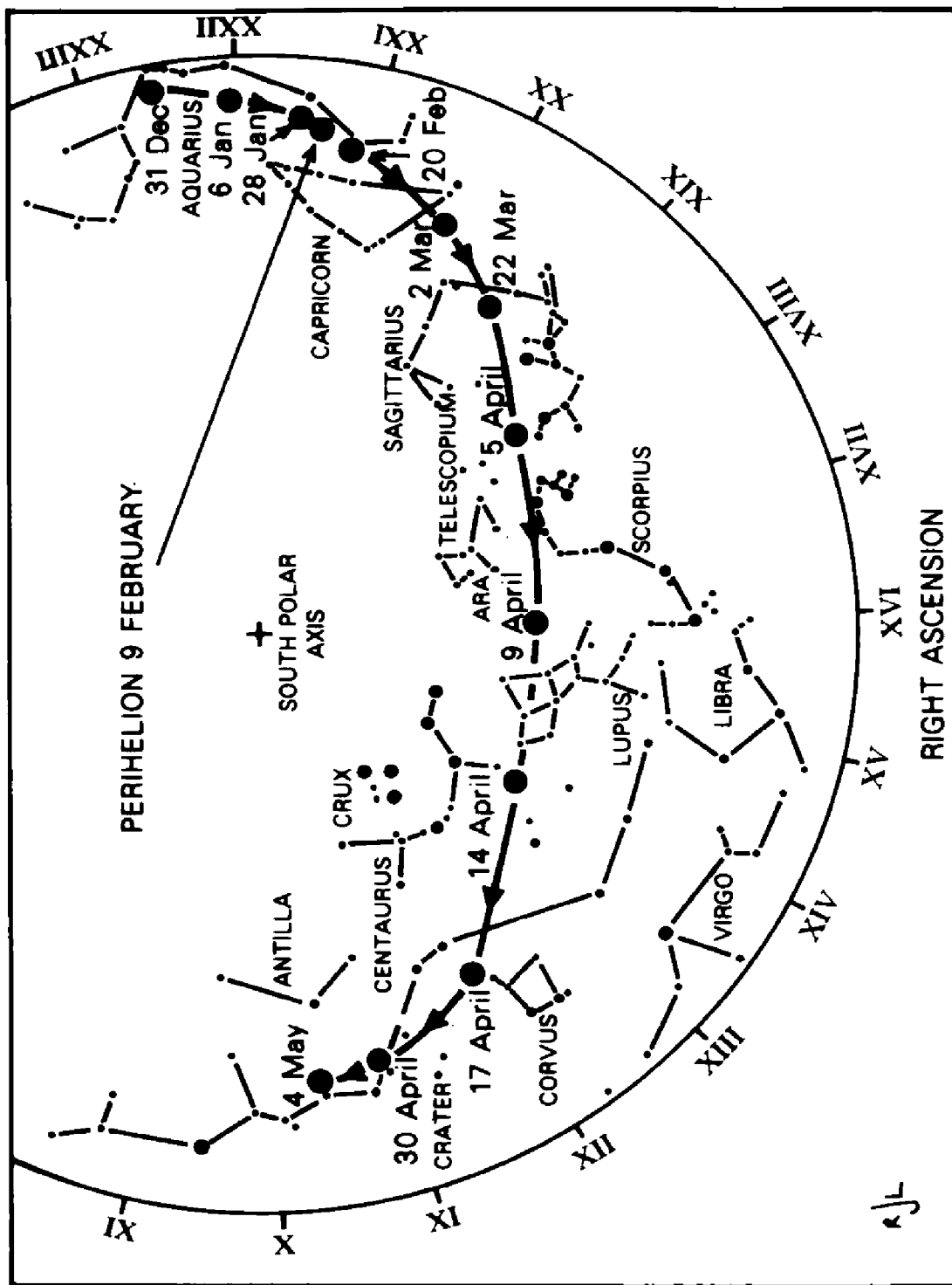


Figure 2. Predicted path of Halley's Comet, 31 December 1985 – 4 May 1986, Southern Hemisphere.

Comets do not always behave as predicted. Biela's comet broke into two and failed to return at the next predicted apparition. Comets can also be fainter than expected as in the case of Kohoutek's comet which caused some embarrassment to the publishers of books about its impending arrival. Conversely, they can suddenly flare up in brightness, thus comet Halley may have some surprises for us as we watch for it.

On the two accompanying charts of the Northern Hemisphere (Figure 1) and Southern Hemisphere (Figure 2) skies, are plotted the predicted positions of the comet for a variety of dates during the course of the present apparition. It is expected to reach a magnitude of about 2.9 at perihelion before fading again. Ships in the Southern Hemisphere are going to have the best ringside seats, and we recommend that night glasses be used to search for and view the comet. Do not be disappointed if you do not see the amount of detail to be found on published photographs. When the comet is bright against a dark, moonless sky, it may be best seen with the naked eye, remembering that the magnification by binoculars will make the image fainter. Observers should attempt to sketch what they see. Photography will only be possible on land using time exposures with equipment designed to rotate the camera to compensate for the rotation of the Earth. In astronomical photography, compensation has to be made also for the fact that the comet is moving with respect to the background of stars as well as for the Earth's rotation.

Note

At the time of writing, on 1 September 1985, observatory reports quoted comet Halley to be some two magnitudes fainter than predicted. It remains to be seen if it will come up to expectations in brightness as it nears the sun, and by the time these notes are published, we shall know the answer.

Epic Voyages of Messages in Bottles

In February 1985 a remarkable document reached the Marine Division of the Met. Office in Bracknell. Captain Basil Biggs sent us on loan his scrap book containing a unique collection of correspondence records resulting from the launching of numerous messages in bottles during his many years at sea. All who saw the book were so fascinated by this record, that an account in *The Marine Observer* was called for.

Captain Biggs started launching bottles containing messages from ships as early as 1959. He kept no records at that time but recalls one of the earliest launched in the North Atlantic being answered by an Irishman. The message had been retrieved near Cork many weeks afterwards, and Captain Biggs sent a reward in the form of an old-type ten-shilling note.

When he retired in February 1982 at the age of 55, Captain Biggs estimated he had launched at least 500 bottles containing short messages as to replies requested, but only about 5 per cent of them had been picked up and answered. The messages contained details of the ship, the area in which the bottle was 'posted', the date and his home address. It was several years before he realised the need to offer a small reward to the finder, which was usually made in the form of used postage stamps. Using the original data, Captain Biggs was able to approximate speed of travel of the bottles returned, estimate the route taken from a knowledge of the great ocean currents and compute average miles per day drifted.

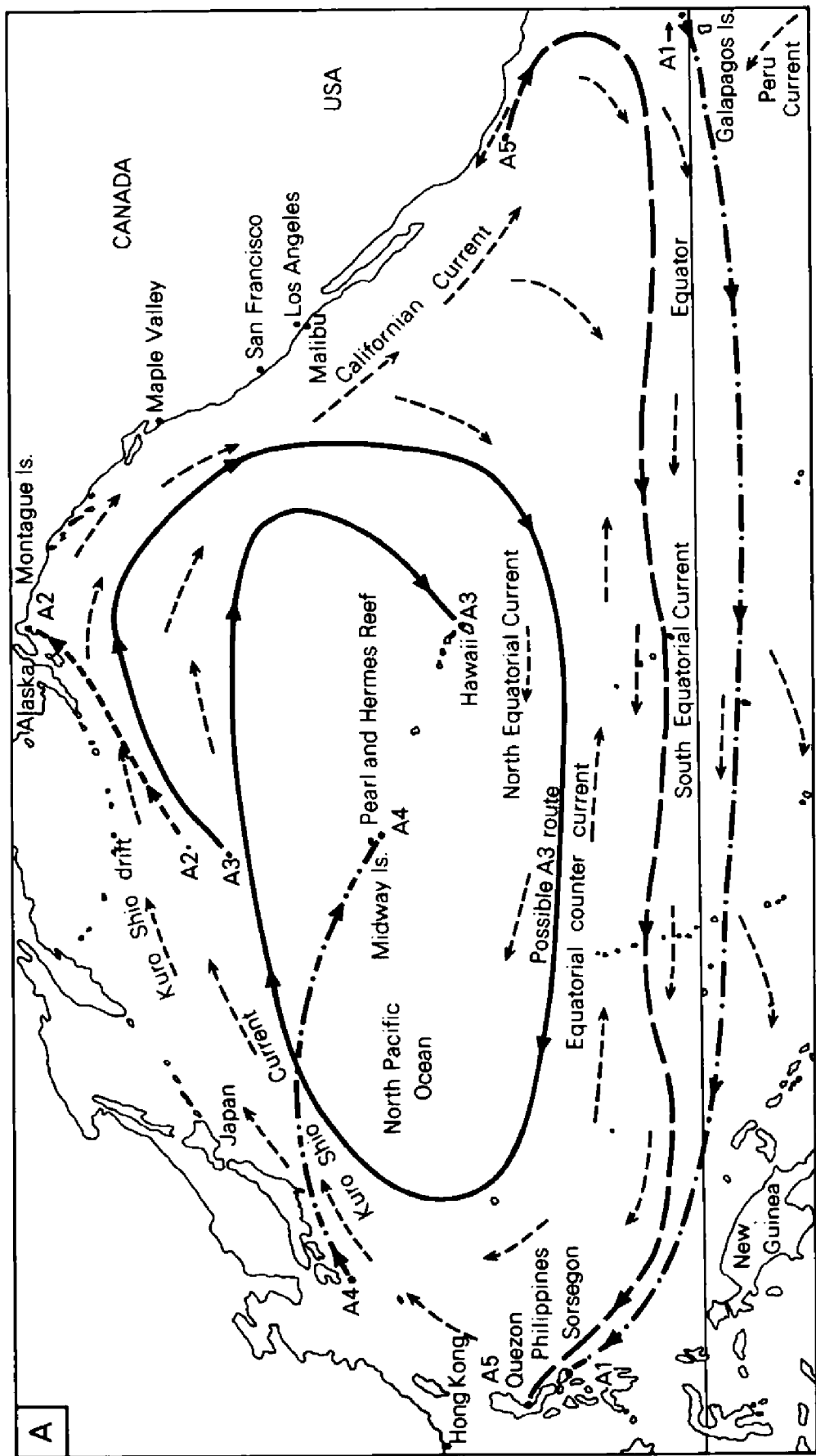
He is still in touch with voices from the sea despite having retired, and the most recent reply to a bottle message reached his home in Whitstable, Kent, in March 1984 two years after he retired. The bottle had been recovered by Armando Formanes, aged 22, at Sorsegon, Philippines, (Map A, reference A1), on 20 March of that year. Captain Biggs' log entry says:

Quite a fast passage for this bottle. I launched it 20 n. mile sw of Balboa, Republic of Panama, on 25 January 1982 and it covered the 9000 miles in 2 years and 3 months at an average rate of 0.463 knots, 11.1 miles per day. The bottle would have taken the North Equatorial Drift aided by the prevailing Easterly winds. My command, the m.v. *Causeway* (Newgate Shipping Co.) was returning to the Mississippi to load grain for Japan again. I left the *Causeway* in the Mississippi 2 weeks after launching the bottle to fly home and retire after 38 years at sea. It had been a very very good life.

His log is filled with fine detail of this kind, recording voyages made and giving opinions on the bottles' own lonely voyages. Sometimes the bottles did not follow the expected long treks by the great ocean drifts, but became entrapped in eddies and travelled a mere few hundred miles to be recovered on nearby coasts.

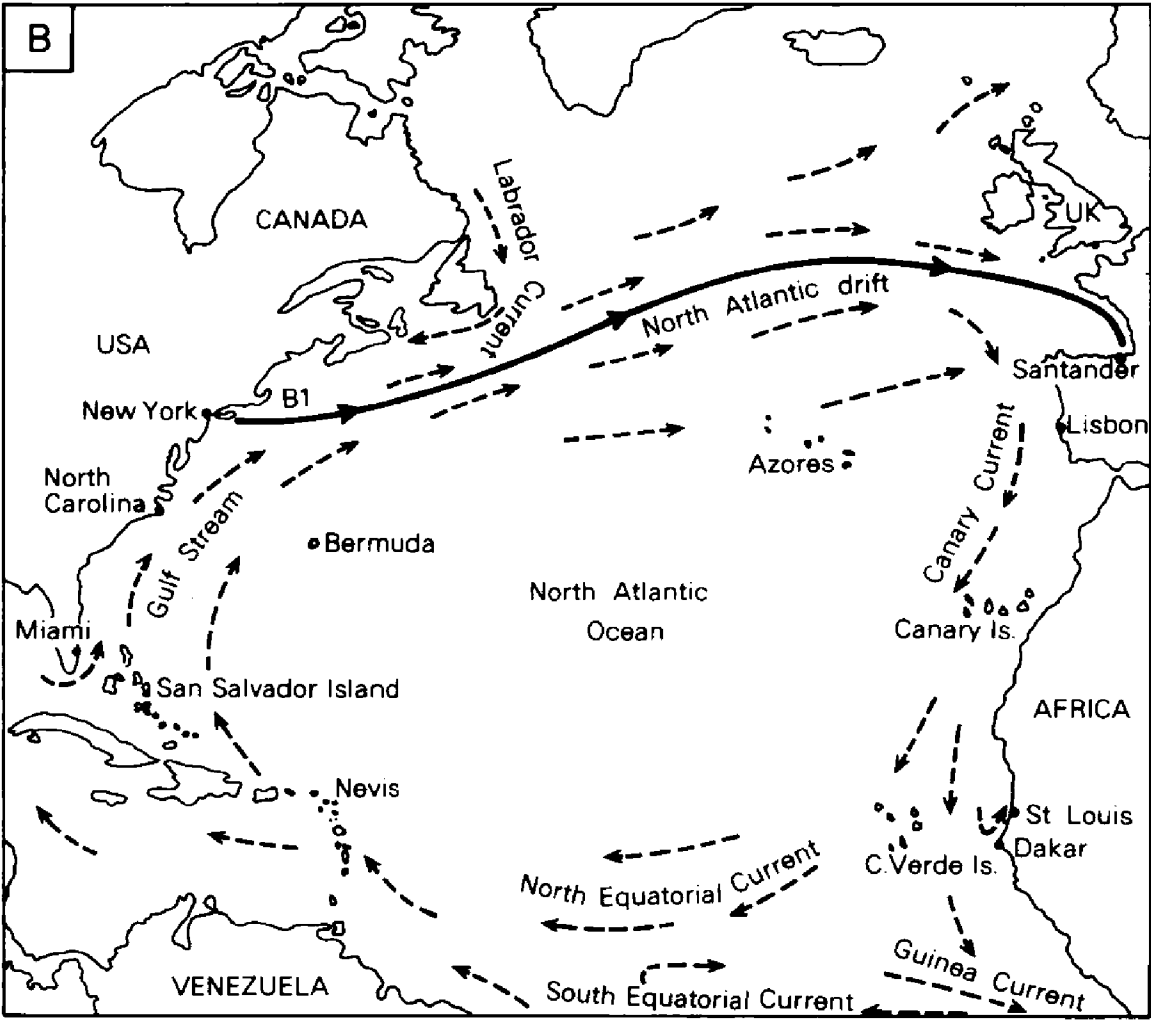
Captain Biggs received one such reply from Diane Thompson of Coff's Harbour, N.S.W., Australia, in 1980; the bottle he had launched off the Great Barrier Reef some eighteen days earlier had travelled only 110 n. mile, whereas he had expected it to be swept out by the East Australian Coast current south and eastwards across the Tasman Sea towards New Zealand. Diane Thompson describes how she came across the bottle containing the message:

While waiting for the tide to fall on the morning of 15 March (1980) at Station Creek, halfway between Coff's Harbour and Grafton, a party of four of us walked up the beach to help pass the time and stumbled upon your bottle and note. It was quite a coincidence as we had found a bottle with a note in it on the same beach 18 months before, and we were explaining to friends the scene when out of the blue there was your bottle and note, just as if we knew where to find it. Keep throwing bottles overboard as they are great fun to find; unfortunately not enough people do it. By the way, did you indulge in the contents of the bottle all on the day of 'posting' it, or was it a longer process?



Map A. Assumed routes followed by five bottles launched in the North Pacific Ocean. Other recovery points are also named.

A typically Australian enquiry! Captain Biggs launched bottles in the Pacific and in the North and South Atlantic. One of the earliest replies he recorded for a bottle sent across the North Atlantic by the Gulf Stream in 1966 was picked up by an 18-years old Spanish girl on holiday near Santander. It had taken a year and 4 months and sailed 3600 n. mile to reach her beach, and in recognition of her pleasant surprise in recovering it, she sent a photograph of herself with her pet dog on the holiday beach. (Map B, reference B1.) They corresponded



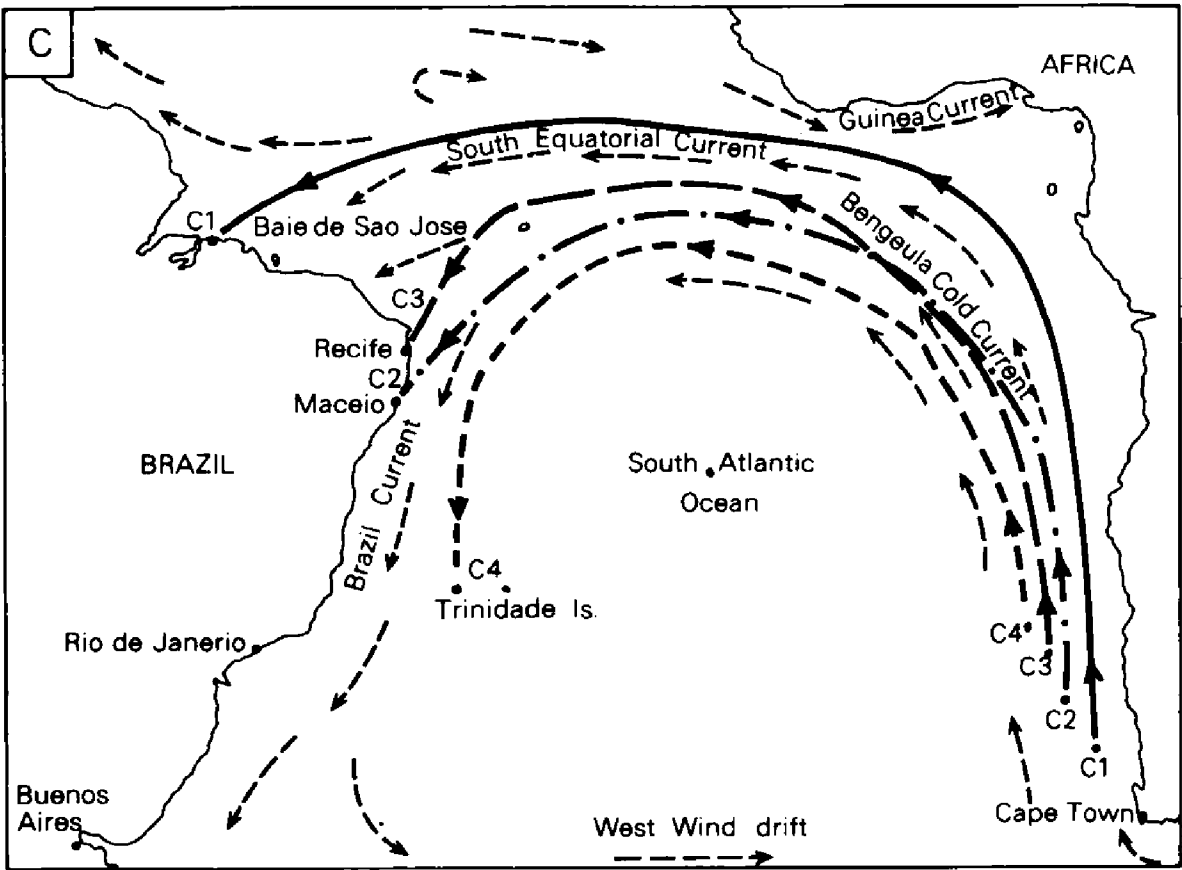
Map B. Assumed route of one bottle launched in the North Atlantic Ocean.
Other recovery points are also named.

occasionally after that, with the result that several years later, the girl visited Captain Biggs and his wife in Kent.

One of the more unusual tracks followed by a 'Biggs bottle' was that of the one recovered by two deer hunters from Anchorage, Alaska, hunting from their lodge on Montague Island off Alaska's southern coast. When on a voyage on m.v. *Bonnieway*, 56 000 tons dwt, with grain from New Orleans to Japan, Captain Biggs had jettisoned the bottle missive whilst on the great circle route between Los Angeles and Japan in mid-North Pacific on 18 January 1980; it was found by the hunters on 10 October 1981, a year and 9 months later, having travelled about 2800 n. mile and been washed by the residue of the great Kuro Shio current 'across the very wild North Pacific; storms are incessant — a

terrible ocean. The message survived in very good condition considering the extreme weather conditions it must have encountered'. (Map A, reference A2.)

Some of the more interesting replies received in response to his bottled notes include one from a fishing boat hundreds of miles south-west of Sierra Leone,



Map C. Assumed routes of four bottles launched off south-west Africa.

no position being given, but coming from a bottle dropped in the South Atlantic which had travelled about 1000 n. mile in 6 months by way of the Benguela and South Equatorial currents; another South Atlantic bottle sailed at an average speed of 0.486 knots a distance of 4200 n. mile in 13 months from a position north-west of Cape Town to be recovered at Baie Sao José on the northern coast of Brazil. (Map C, reference C1.)

On three occasions between 1976 and 1979, bottles were released when passing west of the Cape of Good Hope and, swept along by the Benguela current north and then west around southern Africa's west coast, they were turned more west by the South Equatorial current and then south-west by the Brazil current. They were recovered respectively at Maceio, Recife and at lonely Trinidad Island, 500 n. mile east of Rio. (Map C, references C2, C3 and C4.)

The longest bottle voyage recorded by Captain Biggs started with a launch in early 1980 while his command was in the North Pacific. 'For 3 years 11 months this message was in the wild Pacific', he wrote in his log, 'and though its route is not certain, it could have circled the great ocean twice in that time'.

It was also not certain how long it had lain on a Hawaiian beach before recovery, but his message was still legible enough despite considerable deterioration of the typed words on the back of half of a ship's menu card:

Dropped over from the British ship,
M.V. Bonnieway, in position 40° N,
179° E, during a voyage from the
Panama Canal via Los Angeles to
Japan. If found, please return to:
Captain Basil S. Biggs.

Whitstable,

Kent.

ENGLAND

Please return this card. A small reward
will be sent. Best wishes and good luck.
Dropped over January 21st 1980

On 22 November 1983, a boy named Sonny Paleka, aged 12 years, made the discovery, (Map A, reference A3.), and wrote to Captain Biggs:

I found your letter when I was fishing. It was stuck in the bottle between 3 rocks, on Mo'omomi Beach. I live on Molokai, the state of Hawaii. Take care Capt. Aloha. Sonny Paleka. P.S. Don't forget a reward! and Merry Christmas.

By contrast, the shortest bottle trip he recorded, one that again was intended to be washed westwards across the Pacific, resulted in a postcard mailed from Newport Beach, California, only four days after the bottle had been jettisoned off San Diego, helped along by a storm according to its finder in 1980.

Another bottle recovery in the North Pacific is so remarkable as to border on the realms of fantasy, but the finder's letter rings true enough. (Map A, reference A4.) In October 1980, Captain Biggs threw over a bottle 100 n. mile off southern Japan found, says he:

. . . on Pearl and Hermes Reef, about 2400 miles distant as the flying fish flies, but the bottle was not picked up until 1 year and 9 months after it was launched. It might never have been found had not a scientist been on the remote uninhabited reef situated about 1500 miles WNW of the main Hawaiian Islands in the North Pacific. The NOAA scientist was on a rare visit and was involved in marine research for the U.S. National Maritime Fisheries Service, Honolulu. He was concerned with a programme studying the endangered mammal *Monachus schauinslandi*, a monk seal, and the green sea turtle, *Chelonia mydas*, another threatened animal species.

There is one saga of a recovered flagon message that cannot go unreported, for Captain Biggs found it most moving. He seemed to have particularly good luck with several bottles dropped in January 1980, and this tale concerns the one released off Acapulco, Mexico, on 2 January of that year. The reply came from Barangay, Buhangin, Quezon, Philippines, dated 22 February 1984 and, in a hand obviously unaccustomed to writing in English, the letter began:

Dear Mr Captain Biggs,

First of all I would like to extend our warmest regards to your family circle but keep the lion share. Sir, it was one sunny morning of November 25 1983, my father was walking along the seashore when he saw the bottle. He got it and found the card that you insert inside it together with your name and address. I am just awful sorry for not giving you an early response because of some circumstances that occur in our family life. You know sir, we are belong to poorer family here in our home town, and it is hard for me where I get the stamp that I will need in sending you my message. But although it is worth for me the money, (because the evaluation of the peso here in our country is very cheap) I do not want to disappoint you regarding this matter. I decided to work harder and tried myself to spend enough money so that I can buy a stamp for my letter to you. Until here, I

hope that you will understand my situation regarding in sending you, but I send at once. I pray to the Lord that you may reach this missive of mine in good health and good condition in time of your voyage there in the sea. Shalom! Truly yours, Marilou Cordial.

There is no record of the reply sent by Captain Biggs, but on 1 April, Marilou wrote to him again, enclosing a photograph of herself at her graduation and thanking him for the money and photograph he had sent her. She explained she was seventeen, was the eldest of five children in her family and said how sorry she was that he could not attend her graduation. The letter begins, ‘Dear Captain Basil’, and ends with renewed thanks for his present and, ‘May the God be with you always. Always, Marilou Cordial’. Captain Biggs surmised that the letter picked up by Marilou’s father had travelled about 9000 n. mile in its 3 years 11 months afloat, and may have done two revolutions of the North Pacific. (Map A, reference A5.)

Other replies received to bottle messages are listed below for the benefit of readers:—

YEARS	LAUNCH POINT AND DESTINATION	DURATION	ESTIMATED N. MILE	PROBABLE CURRENTS
1965	Western Atlantic — North Carolina	3 months	350	Labrador
1965	North Atlantic — Cherbourg Peninsular	12 months	3358	Gulf Stream
1969	Off East London — Simonstown	48 days	550	Agulhas
1975	Off Miami — North Florida	1½ months	180	Gulf Stream eddy
1979	Off Dakar — St Louis, Senegal	3 months	150	Canary counter-current
1979/80	Off Lisbon — Nevis, Caribbean	10 months	3000	Canary, North Equatorial
1979/83	South of Canaries — San Salvador, Bahamas	3 years 7 months	2400	Canary, North Equatorial, ? Gulf Stream
1980	South of Los Angeles — Malibu Beach	7 days	70	Californian counter- current
1980	Off Brisbane — King’s Cliffe, Queensland	2 months	100	—
1980/81	180th meridian in far North Pacific — Maple Valley, Washington State, U.S.A.	1 year 4 months	2500	North Pacific, California
1981/82	Off Miami—Cherbourg Peninsular	1 year 10 months	4000	Gulf Stream

The Jubilee Sailing Trust

The Jubilee Sailing Trust was established with a donation from the Queen’s Silver Jubilee Appeal Fund in 1978, from an idea conceived by its founder and secretary Christopher Rudd. BA (Cantab), who has been involved for many years in sailing with the disabled. It was set up to provide the opportunity for a meeting point of the disabled and able-bodied in the unique setting of a sailing ship at sea. It has been found that through the challenges, adventures and achievements of sailing a square-rigger, the scheme offers not just an exhilarating and enjoyable holiday for all its participants, but also provides a unique and effective way of helping a large number of people to win their battle for a new life, and thus helps to shorten the often lengthy and costly process of readjustment to normal life.

The Jubilee Sailing Trust first chartered the brigantine *Soren Larsen* in 1983 for ten weeks. She is best known for her television appearances as the 'Onedin Line' flagship and Shackleton's *Endurance*. She was chartered again for full six-month seasons.

The 1983 programme comprised 10 voyages in the Channel area, of varying lengths to suit different requirements of crew, and were booked almost as soon as announced. The highlight of this first season was the winning of the most coveted of all trophies in the Tall Ships' Race from Weymouth to St Malo — the *Cutty Sark* Bell — given to the ship considered to have done the most to promote international understanding.

The staff of the Trust notice the change in a voyage crew from the day *Soren Larsen* sets sail, to her return from a voyage. Apprehension of what lies ahead is replaced in the handicapped sailors by the confidence and camaraderie that a commonly shared challenge engenders. Friendships are forged between able-bodied and the less fortunate with handicaps. The 105-ft *Soren Larsen* is proving to be a most useful testing ground for the general concept and for the special equipment needed for the disabled. But she has many fundamental drawbacks, not least of which are size and economics.

After extensive study, the Trust commissioned preliminary designs for a purpose-built vessel which, they believe, will provide the best and most economical answer, and such a ship is being built by the Trust.

The new vessel is to be named *Lord Nelson*, and plans are in hand for a naming ceremony to be performed by the Trust Patron, HRH Prince Andrew, CVO, ADC, in the Spring of 1986 in time for the summer season. The *Lord Nelson* is under construction at the yard of James W. Cook and Co. (Wivenhoe) Ltd. in Essex. Her programme is expected to include voyages from her base port of Southampton and also voyages out of the Mersey and Humberside, plus a visit to the Clyde.

The *Lord Nelson* will have accommodation for a crew of over 40, of whom half can be disabled, with up to 8 wheelchairs. There will also be a permanent crew of 7 or 8 including a Medical Purser (SRN). The ship will be a 141-ft barque of 400 tons, designed by Colin Mudie, FRINA, a designer of a wide range of vessels which include T.S. *Royalist* and her sister T.S. *Varuna*. The original project was a smaller vessel, but the need for wheelchairs to move freely round the decks dictated the necessary beam, and the beam decided the required length. The Department of Transport is being consulted and Lloyd's Register are supervising construction to their highest standards.

The Jubilee Sailing Trust has been, and will remain mainly financed by donations from private people, Trusts and business. The aim is to make the operation of the Trust's vessels self-supporting as far as possible from berth fees, but the Trust may, on occasion, subsidise potential crew who are unable to gather the necessary funds from any other source.

The aim of the Trust is in line with the recent International Year of Disabled People — to restore dignity and self-confidence to disabled people and re-integrate them into able-bodied society.

Readers wishing to know more about the Trust should contact the Director General, Jubilee Sailing Trust, Atlantic Road, Eastern Docks, Southampton SO1 1GD or the Fund Raising Office at 25 Victoria Street, London SW1H 0EX.

After retiring from the P. & O. Company in 1985, Captain Dennis Scott-Masson joined the Jubilee Sailing Trust as Director (Fund Raising) which he describes as 'a fascinating and very rewarding occupation' and, as he says in the notice of his retirement on page 43, the services of the Meteorological Office will be of great value to the Trust in the near future.

AURORA NOTES JANUARY TO MARCH 1985

By R. J. LIVESEY

(Director of the Aurora Section of the British Astronomical Association)

In Table 1 are summarized the auroral observations made by mariners in the period and received to date. Details of the principal aurora nights are summarized in Table 2.

Table 1—Marine Aurora Observations January to March 1985

DATE	SHIP	GEOGRAPHIC POSITION		TIME (GMT)	FORMS IN SEQUENCE
1 Jan.	.. <i>Coltair</i>	..	..	61° 35'N, 01° 20'E	2015–2020 ahB. Blue flashes
2	.. <i>Coltair</i>	..	..	61° 35'N, 01° 20'E	2110–2120 qhG
13	.. <i>Starella</i>	..	..	57° 00'N, 20° 00'W	2245–2315 qhA
23	.. <i>Starella</i>	..	..	57° 00'N, 20° 00'W	0735 p ₁ mR ₃ R
28	.. <i>Starella</i>	..	..	57° 00'N, 20° 00'W	0045–0130 qN
28	.. <i>Lloyd Rio</i>	..	..	44° 09'N, 87° 35'E	1500–2300 N, R ₁ R, mRR+m ₃ RB, mS, G
28	.. <i>Starella</i>	..	..	57° 00'N, 20° 00'W	2020–2045 aR ₂ Rm, qN
1 Mar.	.. <i>Jura</i>	..	..	58° 30'N, 06° 20'W	0100–0300 qN
5	.. <i>ACT 7</i>	..	..	48° 38'N, 114° 07'E	1345–1819 qhA, m ₂ hA, m ₂ RB, m ₄ hB, pam ₃ RB, qm ₃ RA+RB, mP, mB, mp ₂ p ₃ RR, hA, pRA
16	.. <i>Resolution Bay</i>	..	..	40° 50'S, 119° 41'E	1300–1430 qhG, qhA, aRA, p ₁ RA, RR
18	.. <i>Starella</i>	..	..	57° 19'N, 19° 33'W	0145 qhA
25	.. <i>Starella</i>	..	..	56° 54'N, 19° 54'W	0550 qN

KEY: a = active, h = homogeneous, m = multiple, m_{2,3} or ₄ = 2, 3 or 4 forms, p = pulsating, p₁ = flaming upwards, p₂ = flickering, p₃ = horizontal streaming, q = quiet, A = Arc, B = Band, G = Glow, N = aurora of specified form, P = Patch, RR = Ray structure, R₁R = small rays, R₂R = medium length rays, R₃R = long rays.

The series of recurrent geomagnetic events and associated aurorae which began on 1 August 1984, owing to the development of a coronal hole in the sun's outer atmosphere and repeated themselves every solar rotation, ceased with the disintegration of the hole in mid-December. However, residual activity during the January — March period was still detectable in the various records of magnetic and radio auroral events.

The visual aurorae reported 27–29 January related to a major magnetic storm triggered off by streams of particles from a coronal hole. The aurora of 27 February, on the other hand, was caused by the explosive outburst of particles from the collapsing of a magnetic field associated with what is called a disappearing 'filament' in the sun's atmosphere. A filament may be defined as a tube or loop of concentrated matter at the boundary of fields of opposite polarity and can be up to 100 000 km long. After a period of up to six months, they can suddenly disintegrate. The magnetic fields can suddenly reorganise themselves and magnetic energy is translated into ejecting particles, which, if they encounter the Earth, cause magnetic and auroral storms similar to those caused by flares that are themselves related to sunspots.

It may be of interest to mariners to note that whereas we are used to north and south magnetic poles on the Earth together with a comparatively even distribution of magnetic field, which permits the magnetic compass to be used

**Table 2—Auroral Storms Reported January to March 1985
(Excluding isolated and high-latitude observations).**

DATE (NIGHT)	LOCATION AND NUMBER OF OBSERVERS	GEOMAGNETIC LATITUDE			MAXIMUM STORM ACTIVITY CODE*	TIME (GMT)
		LOWEST	HIGHEST	AT STORM PEAK		
8/9 Jan.	Scotland, Shetland (3)	59	63	63	5	1846–2200
23	Scotland, Norway (2)	59	66	66	5	1540–2058
27/28	Manitoba, 'Lima', U.K. (3)	52	63	52	5	0045–0259
29	'Lima', England, Southern Ocean (4)	56	63	56	5	1500–2300
29	Scotland (3)	59	61	59	5	1945–2315
10/11 Feb.	Alberta, Norway (2)	64	67	64	5	2200–0635
17	Norway (2)	60	67	67	5	1645–1845
19	North Scotland, Norway (2)	61	67	67	5	1815–2350
24	North Scotland, Norway (2)	61	67	61	5	2120–2345
26/27	North Scotland, Alberta, Norway (3)	61	67	64	5	1800–0600
27/28	North Scotland, U.S.A. (4)	52	61	61	6	2040–0550
5 Mar.	Eastern Atlantic, Indian Ocean (2)	62	62	62	5	1345–2025
10	North Scotland, Norway (2)	60	61	60	2	2015–2215
12	North Scotland, Norway (2)	60	61	60	2	2040–2045
16	Indian Ocean (1)	—	—	—	5	1300–1430

*Storm Activity Code: 1 = Glow, patch or surface, 2 = Homogeneous arc, 3 = Rayed arc
4 = Ray bundles, 5 = Active, pulsating or flaming storm, 6 = Coronal structures.

for navigation, the sun's field is very much more complex, including zones of opposite polarity on the same hemisphere, together with a twisted magnetic 'equator'. On top of this, the general field changes polarity with each sunspot cycle. Spaceships on solar voyages need not be fitted with standard compasses. The effects of the complex solar magnetic field are observed on Earth because the field stretches out into the solar system and encounters the Earth's own field to react with it. Further, the interplanetary magnetic field, as it is called, is instrumental in guiding the electrified particles from solar events and determines often whether or not they may encounter the Earth to produce aurorae, radio aurorae and magnetic storms.

We are reaching the end of the current solar sunspot cycle. The peak of strong transient aurorae took place with the peak of the sunspots in 1979. We appear also to have passed through the main coronal hole type of transient activity related to the declining years of the sunspot cycle. The magnetic field and auroral activity is quietening down.

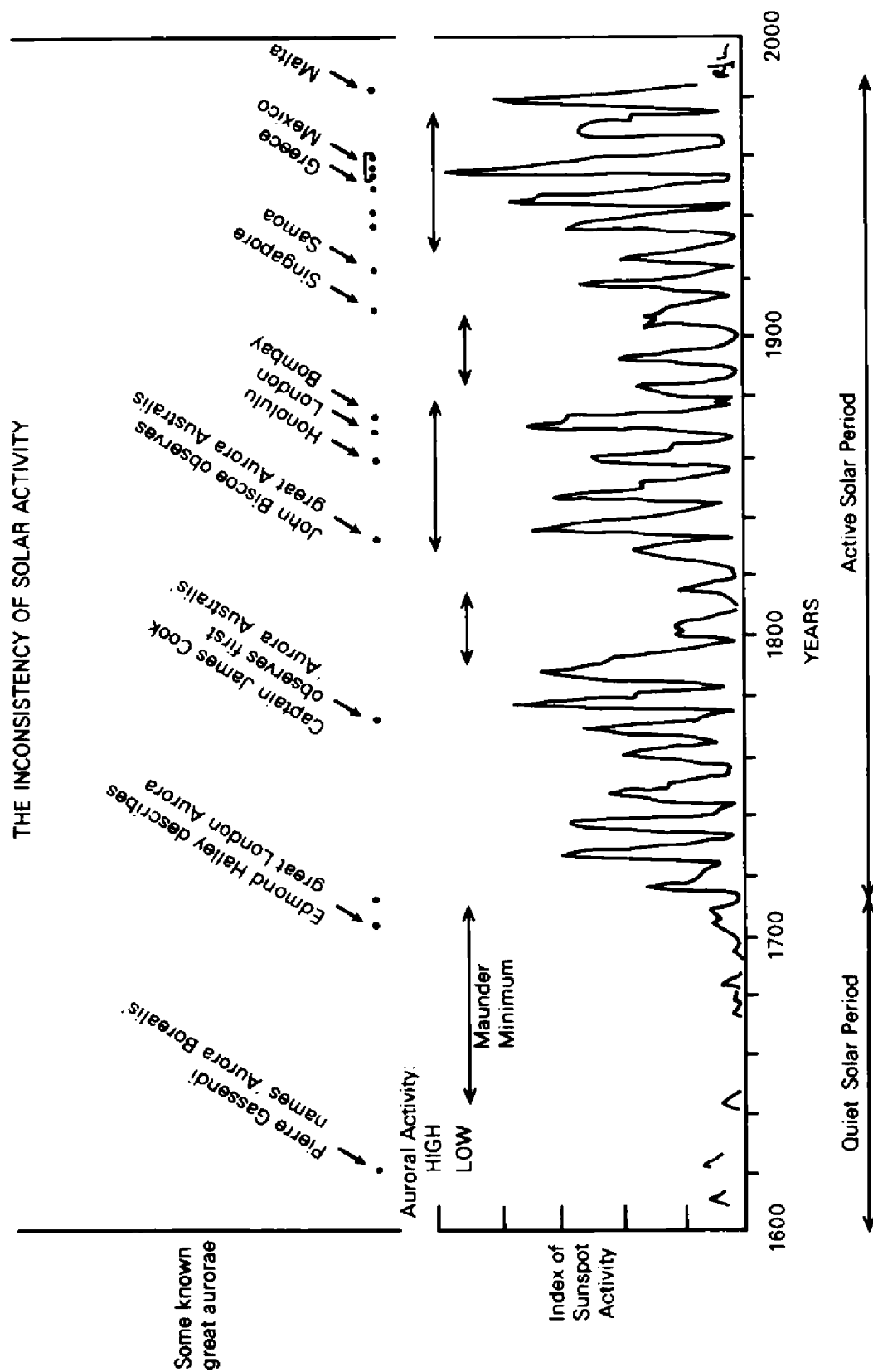


Figure 1. The cyclical rise and fall of sunspot activity.

The cyclical rise and fall of sunspot activity historically has not been a continuous phenomenon. There was a period of depressed activity in the years 1450 to 1550 which is called the Spörer minimum. A second period of depression took place in the Maunder minimum of 1645 to 1715. (Figure 1.) It is recorded by John Flamsteed, first Astronomer Royal at Greenwich, that he detected no sunspots for a period of seven years during the Maunder minimum, when there was also a lack of auroral sightings in mid-latitudes. There was a marked increase in solar and auroral activity from about 1717 onwards when the present series of sunspots began.

Prior to the commencement of continuous observation of the sun by telescopes from about the seventeenth century, solar activity and its variations have had to be deduced from the radio chemistry of glacial and botanical specimens together with the historical records of auroral and naked-eye sunspot sightings. Chinese, Japanese and Korean auroral records go back at least to 600 B.C., while there are references to aurora in the Viking sagas. Some Biblical references are thought to relate to auroral events. Over the centuries prior to scientific investigation, there has been a long tradition of recording the great auroral events in prose, verse and in picture, some fanciful, some wonderfully detailed. Such records have assisted specialists in piecing together the history of solar activity.

We should emphasize that the great auroral events of history are the storm apparitions that descend into mid-latitudes. Up in the high latitudes of the polar regions, the aurora is virtually a continuous event in the zones of most frequent occurrence. However, it is the mid-latitude aurora that acts an index of solar activity in the historic record, for if the sun was inactive then there was no mid-latitude aurora.

I am sorry to say that on occasions, observers in their enthusiasm to write up the activity in the log, have failed either to enter the date or the latitude and longitude at the time of the observation. It does not happen often, but it is a pity to be unable to use data, especially when it is well-recorded, if a vital piece of information is missing.

On the other hand, I would like to commend our observers for the detailed blow-by-blow descriptions made of the aurora as it unfolds and in particular, some of the artistic sketches, together with all the necessary azimuths and altitudes added to complete the picture. By examining the report, it is possible to relive the aurora as the observers saw it and to convert the details without much difficulty into international aurora code, for the purpose of logging the data for future reference. Good sketches sent in by ships are selected for hanging at the British Astronomical Association Exhibition Meeting usually held in London in May, and are also shown at Aurora Section meetings. Please keep up the good work, it is very much appreciated.

SPECIAL LONG-SERVICE AWARDS

The Director General of the Meteorological Office is pleased to announce the names of four shipmasters who have been selected to receive inscribed barographs, in recognition of the longstanding voluntary observing efforts of high quality up to and including the year to December 1984.

1. CAPTAIN A. H. ASTON, Overseas Containers Ltd, has sent us observations in 22 separate years since we received his first meteorological logbook from the *Norfolk* when he was 4th Officer in the New Zealand Shipping Company. He has sent us a total of 34 logs up to this time.

2. CAPTAIN P. D. CULLEN, Furness Withy (Shipping) Ltd, sent us the first logbook bearing his name from the *Manchester Trader* in 1951, and in 28 observing years spent almost entirely in the Manchester City Line ships, provided a total of 59 logbooks.
3. CAPTAIN E. M. S. PHELPS, British Antarctic Survey, and for almost 20 years Master of their R.R.S. *John Biscoe*, first sent in a meteorological log in 1949 from the P. & O. s.s. *Mooltan*. During his 20 observing years he provided us with 34 logs.
4. CAPTAIN J. PARSLOE, Bolton Maritime Management Ltd, started his observing career when serving on the *Rembrandt* of the same company in 1952. He has since provided a further 49 logbooks in 26 observing years.

The barograph awards were instigated in 1948 by the then Director of the Meteorological Office, and they have been presented annually ever since. Officers who have supplied a completed meteorological logbook for the relevant year, and during a minimum of 18 years, are eligible. The recipients have been advised of their awards and arrangements are in hand for the presentations to be made at Bracknell.

LETTERS TO THE EDITOR

From Captain Michael J. Winter, Master m.v. *Dart Britain*, Furness Withy Shipping (Ltd).

'This vessel deplores the possibility of the withdrawal of the GFA Bracknell radio facsimile broadcast in 1986. Extensive use is made of all GFA products, particularly the 500 mb analysis and 24-hour prognosis which are not available from other sources. This product is of great importance in weather routing practise followed in this vessel, and it can be mentioned in this connection that CFH (Halifax, N.S.) has recently discontinued transmission of the 500 mb prognosis.'

Captain Winter will be pleased to know that the decision to withdraw the Bracknell GFA radio-facsimile service has been deferred for the foreseeable future, perhaps on account of the receipt of pleas for its continuance such as his. The reasons behind the proposals for cessation of GFA transmissions were promulgated through the World Meteorological Organisation in July 1985, and included the fact that GFA products are primarily intended for land-based users and are available as GRID code messages on the World Weather Watch Global Communication System.

From Mr J. P. Ayling, 3rd Officer, m.v. *Oriental Chief*, selected ship of the Hong Kong voluntary observing fleet.

'It was with great interest that I read about the treatment of storm petrels by the officers and crew of m.v. *ACT 7* in *The Marine Observer*, January 1985, page 23. Unfortunately it is a common occurrence that birds of many varieties are frequently found stranded on merchant ships all over the world. What is distressing is that officers and crew of these ships are generally unable to help the distressed bird, mainly due to a lack of the basic knowledge of bird care. Obviously someone on board the *ACT 7* knew their birds and did all the right things to assist the petrels, earning a commendation from Captain Young of the R.N.B.W.S. May I therefore suggest that through the medium of your good magazine, a series of articles concerning correct treatment of distressed birds could be published? Perhaps Captain Young would care to contribute some of the required information. Seafarers would then have a reasonable reference

providing basic information for treatment and hopefully, remedies. With this information, perhaps rescues like the one described on the ACT 7 will become more common. *The Marine Observer* is an excellent journal of maritime meteorology, and is read thoroughly on board this ship, often provoking discussion.

A copy of Mr Ayling's letter was sent to Captain Young who replied as follows:

'Mr Ayling's suggestion is a very good one and I hope to include it together with an idea I have regarding advice on the basic details to look for and how to log them when bird observing and reporting. I think this would help both the observers and ourselves with identifications, and I have sent a copy of the letter to Commander Casement, Chairman of the R.N.B.W.S.'

Two letters received in July 1985 from Captain M. M. Reeves, Master, m.v. *Trinidad and Tobago*, The Shipping Corporation of Trinidad & Tobago Ltd, are summarised:

'The letter from Mr P. G. Powell on page 93 of *The Marine Observer*, April 1985, has prompted me to mention certain books. Prior to a recent Marine Society ship's library change I read a review in the shipping press of the recently published book *The Seafarer's Guide to Marine Life* by Paul Horsman (Croom Helm/Marine Society at £12.95) which seems a most suitable book for shipboard perusal. Together with that old favourite *A Field Guide to Seabirds of Britain and the World* by Gerald Tuck (Collins at £4.95) and *Ocean Birds* by Lars Lofgren (Croom Helm at £16.95) it was requested and included in a new library received in June at Rotterdam. Both "Marine Life" and "Field Guide to Seabirds" have been placed on the bridge for all to consult and read. The first mentioned is proving to be most interesting and informative, covering the whole spectrum of ocean life in an easily readable and referenced format. Mr Horsman has certainly filled a long awaited need of those mariners who are interested in "life" as it passes their ships. I would guess that the book may become a standard work of reference on numerous vessels and certainly be considered by the Met. Office as either an Excellent Award book or for permanent placement on board selected ships in the same way as the other text books supplied. The other books mentioned are also candidates for Excellent Awards. As usual, Mrs Rossiter of The Maritime Society has looked after our wishes well and has provided 3 books of great interest which have enhanced our interest in the world around us. Our next request might be for an increased size meteorological logbook.

'Thank you for my Excellent Award for 1984 logbooks from the *Harold La Borde*, which is the sister vessel of *Trinidad and Tobago*, both being owned by the Shipping Corporation of Trinidad and Tobago. These two vessels became selected observing ships when I was serving as Master of the Bibby Line vessel *Wiltshire* and the meteorological equipment was transferred on the sale of the latter. It appeared that both the Met. Office and S.C.O.T.T. were initially dubious about the transfer and involvement for different reasons. Now the Shipping Corporation have accepted the fact that (becoming selected ships) has been a worthwhile exercise at the very least for safety, training and publicity and I hope the Met. Office have no doubts. Please bring into focus the owners of the vessel, and if you can find space, some details of the vessels.'

By now, Captain Reeves will no doubt have read the review of Paul Horsman's excellent guide in the July issue of *The Marine Observer* and we will soon review Lars Lofgren's *Ocean Birds* as requested. We now have a policy of trying to include reviews of a range of different types of publication in each issue: we will also be considering carefully appropriate books for presentation as awards.

It is a fact that we must decide whether or not to invite certain ships to become voluntary observers. In our efforts to find enough suitable ships to make observations, centred mainly with our Port Meteorological Officers, we no longer recruit solely British flag ships as in the past, but we then

have to be carefully selective. For a ship to be sold and our valuable equipment to be lost is not an unknown occurrence, but is fortunately a rare event. However, we are very pleased indeed to have the co-operation of the owners and officers of the S.C.O.T.T. ships, and pleased that there is mutual benefit.

The sister ships are named *Trinidad and Tobago* (pictured opposite page 25), after the two islands making up the Trinidad Republic, and *Harold La Borde*, after a famous Trinidadian round-the-world yachtsman. Built in Japan in 1984, the ships are methanol chemical carriers of 14 324 dwt and chartered to the National Energy Corporation of Trinidad. They are managed by Bibby Line of Liverpool with a mixed crew of British and Trinidadian officers and all Trinidadian ratings. All officers and cadets hold or are studying for British Certificates of Competency.

From Mr J. A. Gates, Radio Officer, R.S. *Africana*, selected ship of the South African voluntary observing fleet.

'On the research ship *Africana* we spend upwards of 250 days a year at sea off the southern coast of Africa, the Southern Ocean and in Antarctica on various research programmes. We are always accompanied by members of the Oceanic and Scientific fraternity whose disciplines include Meteorology, Physical/Chemical Oceanography, Marine Biology, Marine Mammology and Marine Ornithology. It is these last two disciplines which have, in the past, enabled us to make identification of both cetacea and seabirds using those scientists' vast knowledge of quick identification in the field.

'However, most sea-going officers have their pride when it comes to making their own deductions on these subjects and we therefore purchased two books for the bridge bookshelf which we have found to be unsurpassed in helping make our own identifications without having to consult the "boffins". These two books have been aboard now for about a year and we can proudly boast that we have yet to get our identifications wrong. The books are *The Sierra Club Handbook of Whales and Dolphins* by Stephen Leatherwood and Randall R. Reeves, published by Sierra Club books of San Fransisco, and *Seabirds, an Identification Guide* by Peter Harrison, published in the United Kingdom by Croom Helm Ltd.

'... if anyone out there really is serious about making positive identifications of cetacea and seabirds, then take a tip from the "enlightened" amateurs aboard the *Africana* who can now confidently take on the professionals at their own game and keep parity, to boot; endeavour to obtain a copy of each and, I will guarantee, you will not regret it!'

Thanks to Mr Gates for adding to the list of suitable marine life guide books and giving his own experienced views on others we have already reviewed in *The Marine Observer*. We would suggest that readers mention price and year of publication when writing to us on the subject of interesting books, to assist potential readers to select suitable volumes. — Editor.

Personalities

RETIREMENT—COMMODORE J. F. WACHER, CBE, RD, retired from active seafaring in October 1984 after 42 years in the P. & O. S. N. Company interspersed with considerable Royal Navy commitments and training projects within the industry.

John Wacher was born in October 1924 and attended schooling at Colet Court and St Paul's Schools. He joined the P. & O. Company after two years training on H.M.S. *Worcester*, being Chief Cadet Captain when he left there in 1942. He experienced much war service at sea between 1942 and 1945, for which he received commendations.

He obtained his Master's Certificate in 1951 and the following year joined the R.N.R. in the rank of Lieutenant.

After serving as Chief Officer in passenger ships between 1955 and 1959, Commodore Wachter spent a year as Assistant Marine Superintendent during which he carried out original design work on the bridge layout of s.s. *Canberra*, and developed the photo-plot radar display with Kelvin Hughes.

After being appointed Master in 1960, he was in command of several cargo liners and then Staff Captain in passenger ships, until in 1962 he spent 9 months with the Hydrographic Department carrying out original work on the establishment of a British Oceanographic Data Centre which is now part of the Institute of Oceanographic Sciences. In 1963, following studies at Cranfield, he pioneered work and method study investigations at sea, which P. & O. adopted in the cargo fleet, making financial savings as a result.

After a short period in command of s.s. *Iberia*, Commodore Wachter was placed in the lead of another project, new cargo ship design, from which evolved the successful class of three advanced design cargo liners of the Strathardle class, several of which he commanded between 1967 and 1969. He then commanded P. & O. passenger ships from 1969 until his retirement, including the *Chusan*, *Oronsay* and *Oriana*. In 1979 he was appointed Commodore of P. & O. Cruises and took command of s.s. *Canberra*. His last command from 1983 to 1984 was the luxury liner *Sea Princess*, and he had been nautical adviser on the planning and design team for the new *Royal Princess* in 1982.

Commodore Wachter is a Younger Brother of Trinity House, a Member of the Royal Institute of Navigation and Commodore, R.N.R. His involvement with voluntary observing is necessarily limited because of his many extra-marine activities, but he sent us a total of 18 meteorological logbooks, the first in 1947 from the *Canton*, and two of the logs were classed as Excellent. He modestly points out that most of the credit must go to his Third Officers, and goes on to say that he is now in a part time position in the Conference Department of Lloyd's of London Press Ltd, 'to keep the grey cells going'. Our best wishes for continuing good health and work, and a comfortable retirement in the future.

RETIREMENT—When CAPTAIN D. J. SCOTT-MASSON CBE, RD, RNR, retired from the sea after an illustrious career serving with P. & O. S. N. Company, in 1985, he immediately joined the Jubilee Sailing Trust as Director (Fund Raising) and so remained in full employment.

Dennis John Scott-Masson was born in December 1929 at Carshalton, Surrey, and educated at the Nautical College, Pangbourne. On completion of pre-sea training in 1946 he joined Shaw Savill and Albion for his apprenticeship and joined P. & O. as Fourth Officer in 1950. He served almost exclusively in passenger liners from then onwards, gaining his Master's Certificate in 1956 and being promoted to Captain in 1966. He has commanded the P. & O. passenger liners *Chusan*, *Himalaya*, *Arcadia*, *Oronsay*, *Uganda*, *Oriana* and finally *Canberra*. For his part in the Falklands campaign, throughout which he was in command of *Canberra* during her involvement against the Argentine invasion forces, Captain Scott-Masson received the South Atlantic Medal with Clasp and was awarded the C.B.E.

He maintained a parallel career in the R.N.R., serving for periods of up to 9 months in R.N. ships, and was promoted Captain R.N.R. in 1972. He was appointed Aide-de-Camp to Her Majesty the Queen in 1983.

Captain Scott-Masson also espoused the cause of marine observing whenever he was in a position to do so and sent us 30 meteorological logbooks in all, the first one in 1969 from one of his few cargo ship commands, *Pando Strait*. He received an Excellent Award in 1972.

He says that the services of the Meteorological Office will be of inestimable value in operating the Jubilee Sailing Trust's new S.T.S. *Lord Nelson* when she is commissioned later this year, and some extracts from the brochure he supplied are reproduced on page 34. Captain Scott-Masson is a Liveryman of the Honourable Company of Master Mariners.

We wish him every success in his new venture and anticipation of a happy and fruitful retirement.

RETIREMENT—CAPTAIN B. S. BIGGS retired from the sea in February 1982 but still anticipates receiving messages from overseas, as described in the article about his hobby of launching bottle letters, to be found elsewhere in this issue.

Basil Simpson Biggs was born in January 1927, educated at Dartford Grammar School and underwent pre-sea training at Sir John Cass Nautical College. Upon being apprenticed to Prince Line Ltd his first ship in 1944 was s.s. *Egyptian Prince* and 3 years later the Met. Office received his first meteorological logbook from the *Black Prince*. He served in several different shipping companies but says they were all under the same umbrella and changed names as a result of takeovers and management changes.

Captain Biggs saw wartime service in North Atlantic convoys and in the Mediterranean sphere. He sent us 16 meteorological logbooks in his 38 years at sea, 5 of the books being assessed as Excellent, and received an Excellent Award in 1980.

He says he spends most of his time windsurfing on the sea off Whitstable, wearing a dry-suit in winter and wet-suit in summer, and continues to watch the weather forecasts carefully. He says he never knows when the postman may bring him a letter from some distant shore as there must be a large number of his bottled missives still under way in the lonely oceans of the world.

We recently had the pleasure of a visit from Captain Biggs at the Marine Division at Bracknell, and noted in what good health his various hobbies sustained him and we wish him many more years of happy retirement.

RETIREMENT—CAPTAIN R. J. WILLIAMS retired on 1 March 1985, having spent his entire sea career of 40 years with the Shell organisation.

Richard John Williams was born in March 1928 and educated at Cyfarthfa Castle Grammar School. He joined the Anglo Saxon Petroleum Company Ltd in 1945 and in December of that year he joined his first ship, m.v. *Neocardia*. He gained his Master's Certificate in July 1956 and was appointed to his first command, s.s. *Pallium*, just 10 years later.

Captain Williams has the distinction of having been presented with the Thomas Gray Memorial Trust sextant for results in M.N.T.B. examinations, by the Royal Society of Arts in 1948. He says his most rewarding involvement was with the transport of Liquid Natural Gas (LNG) at sea. This began in 1964 as Chief Officer of the *Methane Progress* and continued until the end of his seafaring career in command of the *Tenaga Dua*, one of the world's largest and most sophisticated gas carriers. He was also Master of the Shell Company's training ship *Opalia*, for 2½ years to June 1977.

Captain Williams first sent in a meteorological logbook bearing his name from the *Tribulus* in 1957, one of 27 he has assisted in compiling. In addition, he supplied 17 Shred, or Auxiliary, Report forms, the large number being a common feature for Shell tankers, the nature of whose trading pattern make it impossible for them to undertake full observing at all times. Nine of the logs were marked Excellent and he received Excellent Awards in 1976, 1977 and 1978.

Captain Williams has kind words to say to the Marine Division of the Met. Office: 'Thank you warmly for your kind wishes for my retirement; any contribution I have been able to make to your organisation has been enthusiastically given. I have retired to Merthyr Tydfil to give the heroine of the piece, my wife Joan, some well-deserved attention after 39 good years of seafaring.' We say amen to that, and reciprocate his good wishes.

Book Reviews

Strandings and their Causes by Richard A. Cahill. 245 mm × 160 mm, xvi + 239 pp., *illus.* Fairplay Publications Ltd, 52-54 Southwark Street, London SE1 1UJ. Price: £12.00 in the U.K., £13.00 or U.S.\$18.00 in other countries.

This is a companion volume to *Collisions and their Causes* reviewed in the October 1985 edition and highlights the lessons to be learned from stranding casualties in which the chief cause was simple neglect. Despite the advent of aircraft and of many sophisticated electronic navigational instruments, the mariner neglects the basic seamanship arts at his peril.

Captain Cahill, who graduated from the U.S. Merchant Marine Academy at Kingspoint in 1943 and spent more than half of his active sea career in command, has now provided some critical analyses of strandings caused by poor training and inefficient management.

The 19 chapters cover a multitude of sins of omission by masters and officers which lead to disaster, but the author is not afraid to point the finger at shipowners, marine superintendents and insurers as well, to whose discredit these casualties were ever permitted to occur.

The list of causes is all too long: faulty navigational procedures, negligent and delinquent navigation, casual attitudes, inattention to actualities, misjudgment of masters and officers, misuse of navigational instruments, lack of anticipation of danger, improper anchoring; neglect of soundings, of proper radar use, lookout, urgent communications, of master to monitor officers' performance, to receive or act upon navigation warnings, to keep charts and publications up to date, of passage planning; negligence of watch officers in not calling master when in difficulty, delay in sending distress message, inadequate manning, inexperience of watch officers and of lookouts, pilot error, use of obsolete and small-scale charts, lack of good seamanship, overspeeding in poor visibility and in port approaches.

The list is endless and the catalogue of faults much too long. Because the countries with a professional and caring administration hold detailed enquiries and publish findings, many of the cases dealt with by Captain Cahill give a false impression of a high percentage of cases applying to British and U.S. ships. Beyond the records in this useful book there must be many more unpublished incidents giving rise to the belief that much more good could be done by further revelations of strandings.

In the end, however, Captain Cahill points out that, what is required of the shipmaster when the challenge arises, is more than professional knowledge, it is good judgment when under stress. Invaluable lessons can be learned by masters and students of command alike, from studying this book.

J.F.T.H.

The Royal Yacht Britannia, Life on Board the Floating Palace by Andrew Morton. 285 mm × 220 mm, 128 pp., *illus.* Orbis Publishing Ltd, 20-22 Bedfordbury, London WC2N 4BT. Price: £9.00.

A magnificent colour photograph of the royal yacht *Britannia* dressed overall, forms the jacket of this interesting book and immediately tempts the reader inside for a closer look.

Launched in 1953, the *Britannia* joined a long and illustrious line of royal yachts. Royal yachting began in 1661 during the reign of Charles II, and the history of these craft is described up to the present yacht with most attention paid to the Hanoverian period onwards, and of course to the *Britannia* in particular. The yachts of George III, Queen Victoria and Edward VII are featured, and are illustrated with portraits, sketches and original photographs. All fascinating in their own right as records of the past.

Britannia is a floating palace, a home-from-home for the royal family, and as such, nothing must be forgotten by the planners when preparing for a voyage, be it official or private. Up until recently, even the Rolls Royce was carefully loaded. Inside the yacht, the rooms must function as family, state and hospital quarters, combining the desires of the Admiralty with those of the Queen and Prince Philip. Sketches by the designer Sir Hugh Casson, are included to take the reader on a privileged viewing around some of the royal apartments. There are also chapters which highlight the contrasting roles of the *Britannia*; the annual holiday cruise by the royal family to Scotland which follows the relaxed atmosphere of Cowes Week is featured in one, and another traces the yacht in her capacity as the Queen's official residence whilst abroad. Even this differs from a third role, that of floating honeymoon hotel as used by Princess Margaret, Princess Anne and Prince Charles after their respective weddings.

Throughout the book there are amusing anecdotes and points of interest which make it a delight to pick up and browse through if there is insufficient time to sit down for a good 'read', and it is packed with plenty of high-quality photographs, both in colour and monochrome, plus a cut-away diagram of the yacht's interior lay-out.

It should not be forgotten though, that the *Britannia* is manned by officers and ratings of the Royal Navy and carries a crew of 276 men in total, for whom a posting to the yacht is just another job although the uniform is unique to it and orders are given in sign language in order to maintain the quiet atmosphere on board.

This is an informative and entertaining book which would be well-received by the avid 'royal-watcher' and should also appeal to those curious about life behind the scenes aboard this 'First Lady of the Fleet'.

J.M.

The World Encyclopedia of Fishes by Alwyne Wheeler. 310 mm × 240 mm, xiv + 368 pp., illus. Macdonald and Co. (Publishers) Ltd, Maxwell House, 74 Worship Street, London EC2A 2EN. Price: £19.95.

At a time of experiments and developments in space technology, when life goes on hundreds of miles above the Earth, it is refreshing to review a book dealing with the other largely unexplored world, that of the water, and its inhabitants the fishes.

This handsome book which is an updated reprint of *Fishes of The World*, sets out by way of superb colour photographs together with excellent line-drawings to illustrate representatives of all the recognized families of fishes, while not attempting to cover the total number of species, estimated to be 22 000 in all. From sticklebacks to sharks the basic structural differences between important or abundant groups are given, as are the geographical and habitat associations of each. A glossary of terms and labelled sketches are included for the benefit of readers who are not yet proficient in piscine anatomy.

A section of 500 full colour photographs of fishes follows, each labelled with its latinized, scientific name and plate number. These are cross-referenced with the dictionary of names in the next section of the book; a comprehensive listing

in alphabetical order of both the scientific and common names, together with 700 line-drawings. The cross-referencing operation seems to be slightly cumbersome, with the unfamiliar names needing to be remembered and checked until their locations are found in the listing. Perhaps in a future print, the common names could be included on the plates alongside the scientific ones, purely for convenience. On the other hand, friends may be impressed if one can instantly recall *Gadus morhua* instead of 'cod', or *Pleuronectes platessa* instead of 'plaice', in conversation!

The quantity of colour work in this book is reflected in the price which may well be beyond the reach of the casual reader's pocket. However, it is a book that needs to be bought only once to make a very useful and colourful addition to the reference library of anyone with interests in the natural world, and the marine environment in particular.

J.M.

Maritime Meteorology—A Guide for Deck Officers by Charles W. Roberts and C. E. N. Frankcom. 210 mm × 140 mm, xii + 258 pp., *illus.* Thomas Reed Publications Ltd, 36–37 Cock Lane, London EC1Y 9BY (1984). Price: £11.50.

This book has been written primarily for the use of deck officers, and is designed for use when studying, or as a permanent book of reference in the chartroom. It encompasses most aspects of marine meteorology, including weather routeing, weather maps, and the effects of weather on cargo.

The book has been published in a soft linen-backed binding with 258 pages, and includes black-and-white plates of cloud types, states of sea, and an excellent view of a waterspout. The text has been divided into 28 chapters which are well indexed in eight 'Content' pages, and most of the definitions have been collected into a 26-page glossary which not only provides a convenient reference, but also helps to keep the text uncluttered. Fourteen pages of questions have been included to enable the student to test his knowledge and understanding of what he has read; the questions are arranged in order of sequence, and grouped under chapter number.

None of the subjects have been treated in depth, and the text has not only been intentionally restricted to simple English, but is well illustrated by clear, well drawn figures, so the explanations and examples should be easily understood by students; even those for whom English is a second language.

It was disappointing to find that 'feet' had been used extensively as the unit of measurement of height, and the Fahrenheit scale for expressing temperature; this must limit the practical value of some sections of the book for any student who is preparing for an examination which is set in S.I. units.

Captain J. C. Cox, Extra Master

Footnote: Commander Frankcom was Marine Superintendent of the Meteorological Office from 1938 to 1969, except during the war years when he saw distinguished service with the Royal Navy, and is therefore well qualified to write this book.

Fleet Lists

Corrections to the list published in the July 1985 edition of *The Marine Observer*.
Information regarding these corrections is required by 30 September each year. Information for the July lists is required by 31 March each year.

GREAT BRITAIN

Corrections to 'Marid' ships:		
NAME OF VESSEL	MASTER	OWNER/MANAGER
Garrison Point	H. Horsley	Hudson S. S. Co. Ltd
Warden Point	R. Gatiss	Hudson S. S. Co. Ltd

GREAT BRITAIN

The following ships have been recruited as Selected or Supplementary Ships:

NAME OF VESSEL	DATE OF RECRUITMENT	MASTER	OBSERVING OFFICERS	SENIOR RADIO OFFICER	OWNER/MANAGER
<i>Arctic Corsair</i>	22.7.85	B. Wharam	A. Spence	N. Clarke	Boyd Line Ltd
<i>Atlantic Confidence</i>	27.6.85	J. Yao	D. M. Hopkin, M. Wood, C. Hall	C. Wadsworth	Furness Withy (Shipping) Ltd
<i>B.P. Vigour</i>	30.6.85	B. Wardman	J. Fidler, P. Cross, D. Stilton	N. Lawrence	B.P. Shipping Ltd
<i>Bora Universal</i>	15.5.85	J. Foggin	R. Thomson, G. Pettingell	M. McKenna	Gateway Shipping Ltd
<i>Cape Thistle</i>	29.3.85	R. Bennett	M. A. Jackson, S. R. Brice, J. Kennedy	B. C. Van Twest	Indo-China S. N. Co. Ltd
<i>Chelsfield</i>	28.6.85	M. Cummings	D. M. P. S. Gunaratne, D. Brown, D. Green	J. Porter	Burmes Markes (Ship Management) Ltd
<i>Ebalina</i>	16.8.85	M. R. Cowton	C. Seagrave, G. Wilkinson, M. McHugh	A. G. Thomson	Shell Tankers (U.K.) Ltd
<i>Elgurdabia</i>	4.5.85	P. J. Duff	C. R. Booker	J. Connelly	Ocean Fleets Ltd
<i>Erinna</i>	16.8.85	B. S. Rennison	C. N. Lovett, P. T. I. Pinches, D. A. Thomson	G. Tonge	Shell Tankers (U.K.) Ltd
<i>Farnella</i>	15.7.85	R. Hadgraft	L. Whurr, F. Gordon	D. Woolland	J. Marr & Son Ltd
<i>Greenpeace</i>	25.7.85	J. Castle	J. Sprange, W. Lampe	N. Tripathy	Greenpeace Rainbow Warrior Holdings
<i>Harefield</i>	2.4.85	J. Ridout	M. J. Howorth, K. V. Obeyesekere, J. Wright	P. Laycock	Burmes Markes (Ship Management) Ltd
<i>Harlech</i>	3.7.85	N. Passey	U. Bhandarkar, C. Y. S. Nath, G. Vurgese	M. B. Seon	Blue Star Ship Management Ltd
<i>I.T.M. Installer</i>	10.4.85	H. Cole	R. Greenwood, A. Appleby	M. McMahon	I.T.M. (Offshore) Ltd
<i>Lancasterbrook</i>	3.6.85	R. Blackburn	M. Scales, P. Bruen	G. Kean	F. T. Everard & Sons Ltd
<i>Maersk Harrier</i>	24.4.85	H. Davis	M. Catt	R. Chapman	Maersk Co. Ltd
<i>Mount Eden</i>	3.4.85	R. Carr	G. Bates, G. Himsworth, P. Savory	C. Anderson	Souter Hamlet Ltd
<i>Pacific Sandpiper</i>	17.6.85	A. Lacey	S. Nathan, M. O'Dell, M. Bookham	M. Haugh	James Fisher & Sons P.L.C.
<i>Petersfield</i>	1.8.85	A. H. Gardiner	C. Hurford, D. Conway, J. Meridith	S. Jayawickrema	Burmes Markes (Ship Management) Ltd
<i>Rapana</i>	2.9.85	C. Skelton	Ang Beng Kee, C. F. Campbell, Hong Tai Lin	P. Flynn	Shell Tankers (U.K.) Ltd
<i>Reefer Yambu</i>	30.5.85	B. Austin-Smith	H. Roberts	R. K. Merriot	Sembawang Reefer Lines
<i>Scotish Star</i>	29.3.85	J. Bilton	N. Mauger, S. Ding, J. Clamp	G. E. Miller	Blue Star Ship Management Ltd
<i>Snow Flower</i>	8.8.85	M. Baker	A. B. Betteridge, J. Bane, D. A. F. Rosairo		Wallem Specialised Management Services Ltd
<i>Sun Suma</i>	21.6.85	J. Clapham	G. Armstrong, J. Robling		Burmes Markes (Ship Management) Ltd
<i>Texaco Windsor</i>	13.8.85	G. Coker	A. J. Peerman, C. H. Knight, A. J. Wilkinson		Texaco Overseas Tankships Ltd
<i>Toti Arrow</i>	4.6.85	R. Shore	A. R. Southwood, W. Parker, A. Watson		Indo-China S. N. Co. Ltd
<i>Tricula</i>	22.6.85	G. Henderson			Shell Tankers (U.K.) Ltd

The following Selected Ships have been deleted:

Alcor, Amastra, Apapa Palm, Atlantic Clipper, British Avon, Carinthia, Carmania, Discovery, Donovanian, Fred Everard, Halia, London Enterprise, London Glory, Norse Marshal, Northern Valley, Orwell Fisher, Pollenger, Samaria, Saxonia, Scottish Lion, Scythia, Tacoma City, Uganda, Wellpark.

BRITISH COMMONWEALTH

AUSTRALIA (Information dated 4.9.85)

The following Selected Ships have been recruited since the list published in the July 1985 edition of *The Marine Observer*:

Abel Tasman, Barber Taif, Ilongo, Iron Shortland, Iron Sirius, Iron Somersby, Iron Spencer, Iron Sturt, Iron Whyalla, Island Gas, Orv Franklin, River Torrens.

The following ships have been deleted:

Bass Trader, Dick Smith Explorer, Ellsborg, Empress of Australia, Gerringong, Icebird, Selwyn Range, Tarago.

NEW ZEALAND (Information dated 1.8.85)

The following ships have been recruited since the list published in the October 1985 edition of *The Marine Observer*:

Express, Jebsen Tauranga, Pacific Ataawhai, Spirit of Competition.

The following ships have been deleted:

Eagle Arrow, Otago Galliard, Toki Arrow, Union Nelson.

The following Supplementary Ship has been deleted:

Sealink.

There are now 13 Auxilliary Ships currently reporting.



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